

N O T I C E

THIS DOCUMENT HAS BEEN REPRODUCED FROM
MICROFICHE. ALTHOUGH IT IS RECOGNIZED THAT
CERTAIN PORTIONS ARE ILLEGIBLE, IT IS BEING RELEASED
IN THE INTEREST OF MAKING AVAILABLE AS MUCH
INFORMATION AS POSSIBLE

"Made available under NASA sponsorship
in the interest of early and wide dis-
semination of Earth Resources Survey
Program information and without liability
for any use made thereof."

80-10210
JSC-11864

NASA CR-

160648

FINAL DESIGN SPECIFICATION
FOR
LARSYS MODIFICATION/FISHER
F-DISTRIBUTION THRESHOLDING

(E80-10210) FINAL DESIGN SPECIFICATION FOR
LARSYS MODIFICATION/FISHER F-DISTRIBUTION
THRESHOLDING (Lockheed Electronics Co.)
61 p HC A04/MF A01

N80-29789

CSCL 05B

ORCLAS

83/43 00210

Prepared By
Lockheed Electronics Company, Inc.
Aerospace Systems Division
Houston, Texas

Contract NAS 9-15200

For
EARTH OBSERVATIONS DIVISION



National Aeronautics and Space Administration
LYNDON B. JOHNSON SPACE CENTER

Houston, Texas

December 1976

LEC-9963

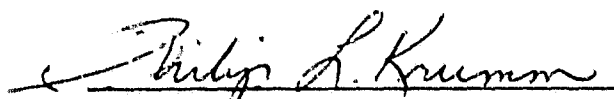
FINAL DESIGN SPECIFICATION
FOR
LARSYS MODIFICATION/FISHER
F-DISTRIBUTION THRESHOLDING

Job Order 81-127
(TIRF 76-0074)

PREPARED BY


R. M. Rodriguez

APPROVED BY


P. L. Krumm, Supervisor
Software Development Section

Prepared by
Lockheed Electronics Company, Inc.
For
Earth Observation Division

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
LYNDON B. JOHNSON SPACE CENTER
HOUSTON, TEXAS

December 1976

TABLE OF CONTENTS

	<u>PAGE</u>
1. SCOPE	1-1
2. APPLICABLE DOCUMENTS	2-1
3. SYSTEM DESCRIPTION	3-1
4. OPERATION	4-1
5. TEST PROCEDURE	5-1
6. TEST VERIFICATION	6-1
APPENDIX A - FLOWCHART	A-1
B - LISTINGS	B-1
C - MAPTAP FORMAT	C-1
D - ERROR MESSAGES	D-1

* PRECEDING PAGE BLANK NOT FILMED

1. SCOPE

This specification establishes the final design of modifications to the display processor within the EOD-LARSYS system, as specified in IDSD category 1 task agreement, titled "LARSYS Modification/Fisher F-distribution Thresholding".

2. APPLICABLE DOCUMENTS

The following documents form a part of this specification:

- o User Documentation, EOD-LARSYS LEC-3984 Rev. 2
- o Task Agreement Titled: LARSYS Modification/Fisher F-distribution Thresholding
- o TIRF 76-0074

3. SYSTEM DESCRIPTION

3.1 HARDWARE DESCRIPTION

N/A

3.2 SOFTWARE DESCRIPTION

The purpose of this modification was to develop a fifth thresholding option for the DISPLAY processor of the EOD-LARSYS system. The new option uses program generated Fisher F-distribution values as the threshold to determine assignment of pixels to the null (thresholded) class.

The other thresholding options provided by the DISPLAY processor are:

- o NO THRESHOLD
- o Thresholding with user-supplied (INPUT) threshold values
- o Thresholding with "Empirical" distribution of quadratic function values (program generated).
- o Thresholding with CHI-Squared distribution values (program generated)

The modification for the Fisher F-distribution option was incorporated into the existing program logic. An additional routine, FDIST, was generated to compute the Fisher F-distribution values. The LARSYS segmentation map (LARSAA) was modified to include the FDIST routine in the display overlay. Record two of the MAPTAP file, created by CLSFY1, was modified to include the number of pixels in each training subclass (KEPPTS(NOSUB2)). The DISPLAY common block, DISPL, in the proc element CMBK10 was increased to include KEPPTS(60).

Changes were made to the following routines in the DISPLAY processor: CLSFY1, DSPLAY, REDIF3, SETUP3. These various elements will be discussed in the order of use. Appendix A contains a DISPLAY processor flowchart. The program listings are in Appendix B, in alphabetical order.

3.2.1 DSPLAY

3.2.1.1 Linkage

DSPLAY is called from the LARSYS system executive routine, MONTOR. DSPLAY calls SETUP3, DSPLY1, EMTHRS, FDIST, DSPLY2, and PRTECT.

3.2.1.2 Interface

The DISPL common block is used as an interface among all the DISPLAY processor's routines.

3.2.1.3 Inputs

None

3.2.1.4 Outputs

Prints error message on printer - see Appendix D.

3.2.1.5 Storage Requirements

Storage used: Code = 307₈, Data = 40₈

3.2.1.6 Description

DSPLAY is the driver for the DISPLAY Processor. It was modified to enable it to test for the FISHER F-distribution thresholding option and to call subroutine FDIST to compute the threshold

values. All other processing in DISPLAY remains the same.

3.2.1.7 FLOWCHART

See Appendix A.

3.2.1.8 LISTINS

See Appendix B.

3.2.2 CLSFY1

3.2.2.1 Linkage

CLSFY1 is called from CLSFY. CLSFY1 calls RELERR, WRTFLD, THRESH, WRTMTX, MCHLSK.

3.2.2.2 Interface

N/A

3.2.2.3 Inputs

None

3.2.2.4 Outputs

CLSFY1 outputs a MAPTAP file. (See Appendix C for MAPTAP format) and outputs tabular listing on printer.

3.2.2.5 Storage Requirements

Storage used: Code = 1611₈ Data = 437₈

3.2.2.6 Description

CLSFY1 was modified to enable it to output the total number of training field pixels (KEPPTS) per subclass on the second record of the MAPTAP file.

3.2.2.7 Flowchart

N/A

3.2.2.8 LISTING

See Appendix B.

3.2.3 SETUP3

3.2.3.1 Linkage

SETUP 3 is called by DISPLAY. SETUP3 calls FIND, NUMBER, FSBSFL, REDIF3, WRTFLD.

3.2.3.2 Interface

N/A

3.2.3.3 Inputs

None

3.2.3.4 Outputs

Prints list of options selected and diagnostic messages.

3.2.3.5 Storage Requirements

Storage used: Code = 1464₈ Data = 553₈

3.2.3.6 Description

SETUP3 initializes the reading of the classification results (MAPTAP) file and the input processor control card(s). It also prints a list of the options that were selected and determines the coordinates of the rectangular areas which encompass the training or test fields required. SETUP3 was modified to enable it

to read the modified second record of the MAPTAP file, to recognize the FISHER option, and to print the message "Apply FISHER F-distribution thresholds".

3.2.3.7 Flowchart

N/A

3.2.3.8 Listing

See Appendix B.

3.2.4 REDIF3

3.2.4.1 Linkage

REDIF3 is called by SETUP3. REDIF3 calls CHIN, NXTCHR, FIND, FLTNUM, LAREAD.

3.2.4.2 Interface

N/A

3.2.4.3 Inputs

REDIF3 reads the supervisor (control) cards in the input cards and STAT data from the MAPTAP file.

3.2.4.4 Outputs

Prints diagnostic messages.

3.2.4.5 Storage Requirements

Storage used: Code = 1452₈ Data = 545₈

3.2.4.6 Description

REDIF3 reads and analyzes the input processor control cards to set processor control flags. The routine was modified to recognize the FISHER option card and in this process, the logic to test the threshold options was changed because of the increased number of options. A new feature was added to limit the threshold option to be the last one read, in case more than one threshold option was requested. The FISHER threshold option includes a test to assure that the number of pixels for each subclass is greater than the number of channels, which is required for the threshold value to be computed correctly for the given subclass.

3.2.4.7 Flowchart

N/A

3.2.4.8 Listing

See Appendix B.

3.2.5 FDIST'

3.2.5.1 Linkage

FDIST is called by DISPLAY. FDIST calls FISHIN.

3.2.5.2 Interface

N/A

3.2.5.3 Inputs

None

3.2.5.4 Outputs

None

3.2.5.5 Storage Requirements

Storage used: Code = 103₈ Data = 136₈

3.2.5.6 Description

The FDIST routine computes the threshold values for the FISHER F-distribution option. FDIST uses the FISHIN routine from the UNIVAC system's STAT-PACK library to obtain the FISHER F-distribution values. The following equations are used to arrive at the threshold value:

VAR = FISHIN(F(I),N1,N2,\$1) ---value returned from FISHIN

Parameters:

F(I) = confidence level , for subclass I

N1 = No. of channels

N2 = No. of samples - No. of channels (i.e., KEPPTS(I)-N1)

\$1 = overflow condition address return.

$$FK = \frac{P(N+1)(N-1)}{(N-P)N}$$

where P = No. of channels

N = No. of samples

$$THRES = FK * VAR$$

The threshold values are computed for each subclass. If the FISHIN routine returns an overflow condition for a particular subclass, the threshold value will be set to 999.999 for that subclass.

3.2.5.7 Flowchart

N/A

3.2.5.8 Listing

See Appendix B.

4.0 OPERATION

The FOD-LARSYS system of processors operates on the UNIVAC EXEC2 computer system. The user is required to set-up an input deck of cards containing the processor control cards as described in the LARSYS users document and to submit the deck to the computer center.

The following processor control card is required to initiate the F-distribution threshold options. Changes were made to the DISPLAY processor operating instructions in the LARSYS user document to reflect the addition of this processor control card:

OPTIONS	FISHER	Compute thresholds from the FISHER
	*	F-distribution, using the confidence
		levels input on the threshold control
		card.

-
- * If the threshold control card is input, one of the four options (CHI-SQUARE, FISHER, EMPIRICAL, or THRESHOLD VALUES) should be input also. If the option card is omitted and the THRESHOLD card is input, CHI-SQUARE is assumed. If more than one threshold option is input, only the last one read will be performed.

5.0 TEST PROCEDURE

Make runs on each of the threshold options including the "no threshold" option to verify the operation and performance of the new FISHER F-distribution threshold option, and test the integrity of the system. In addition the STATS, PLOT, PLT, OUTLINE and FILTER options are turned on for each run to make all runs on the same set of data.

The outputs of the five thresholding options are compared and check for accuracy. The FISHER input and output is analyzed.

6.0 TEST VERIFICATION

For LARSYS Modification/Fisher F-Distribution Thresholding

This verification is being conducted to insure that the delivered program products satisfy the requirements as originally stated by the requesting organization.

M. C. Trinkel
NASA Monitor

J. C. Minter
Requestor

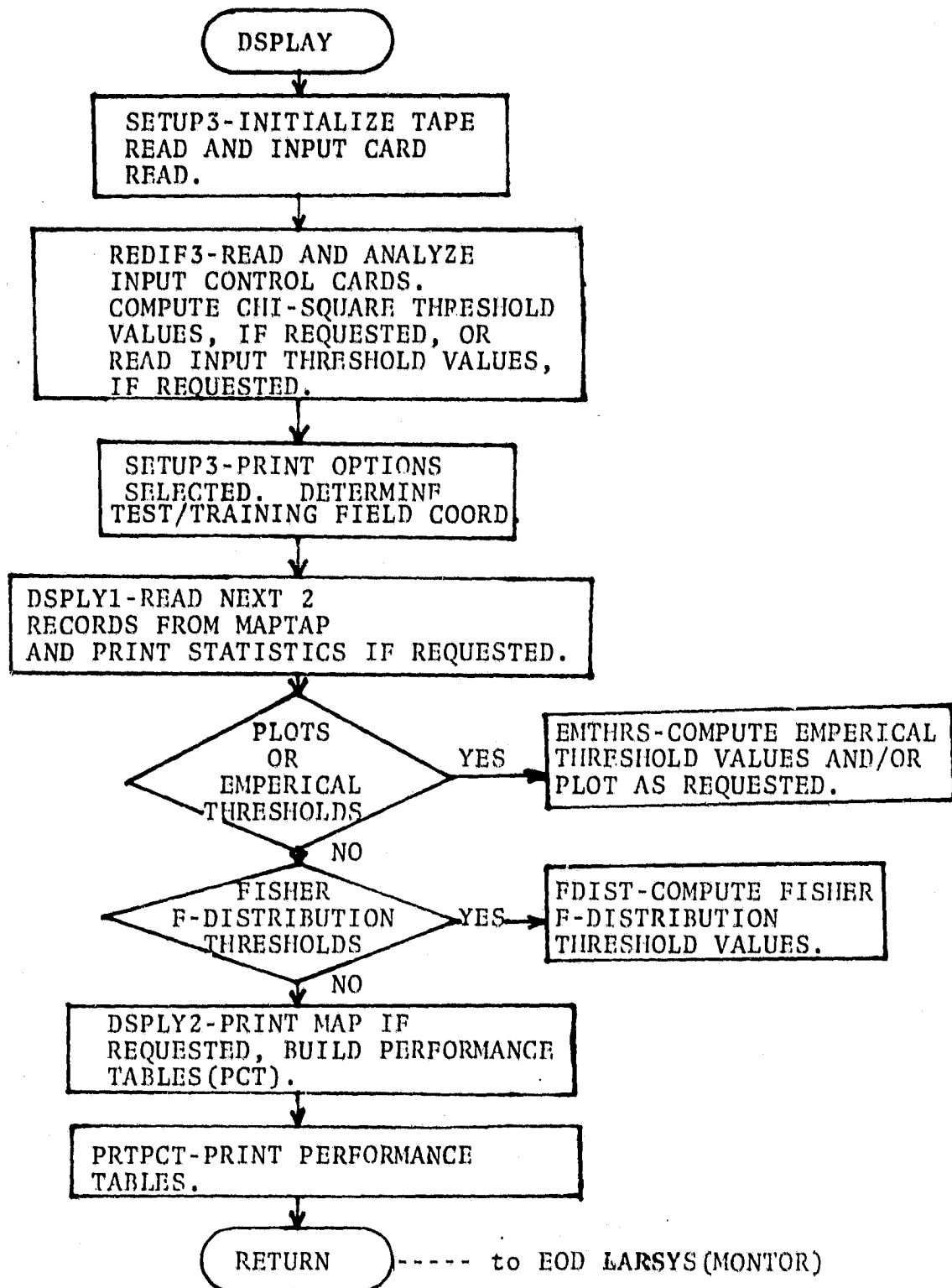
Edolfo Rodriguez
Developer

Wiley S. Krumm
Cognizant System Manager

L. F. Mack
Quality Assurance

Verification Date: 11/2/76

APPENDIX A
FLOWCHART



APPENDIX B
LISTINGS



OL PDP, * CMBK10.CMBK10
PDP BL1 2403 0010
THIS PROC ELEMENT PROCESSED ON 03 NOV 76 AT 16:35:17

03 NOV 76

161

```
000001      PROC ORIGIN 1      ENTRY POINT 1      CMBK10*      FCOPY
000002                                  COMMON/DISPL/CATFLG,CATNAM(61),CLSNAM(61),SUBNAM(61),SUBNO(60),
000003                                  *          SUBCAT(60),CLSSUB(60),NOMAP,TOTVT3,NOSUB3,
000004                                  *          PCFDKY,TSTKEY,TRNKEY,THRSKY,STATKY,EMPTAS,THRSVA,
000005                                  *          PLTKEY,BMFLG,BMCOMB,BMFEAT,CDATE(2),
000006                                  *          FLOSV2,FIELD2,VERTX2,FLOSV3,FIELD3,VERTX3,PCTID3,
000007                                  *          THRES(60),SYMMTX(66),HIGH(60),CON(60)
000008                                  *          ,FLOKEY,NOFLO2,NOFLO3,NOFET2,FETVC2(30)
000009                                  *          ,NOSUB2,NOTRFD,TOTVT2,NOCLS2
000010                                  *          ,KATNO(60),NOCAT,FILTER,MAPFMT
000011                                  *          ,DESKEY,DESUNI,DESOTH,CROP ,ACROP,AOTHR,ATOTAL
000012                                  *          ,SITE(4),ANALYS(3),CAN(10),CRPKEY,KEPPTS(60)
000013                                  END
000014      PROC ORIGIN 2      ENTRY POINT 2      CONT10*      FCOPY
000015      C*
000016      C*      COMMON BLOCK DISPL IS USED ONLY IN THE DISPLAY PROCESSOR
000017      C*
000018      C*
000019      C*      DEFINITIONS
000020      C*
000021      C*      CATFLG - FLAG INDICATING WHETHER OR NOT CATEGORY PERFORMANCE
000022      C*      REPORTS MUST BE GENERATED.
000023      C*      CATNAM - NAMES OF CATEGORIES. READ FROM MAPTAP.
000024      C*      CLSNAM - NAMES OF CLASSES. READ FROM MAPTAP.
000025      C*      SUBNAM - NAMES OF SUBCLASSES. READ FROM MAPTAP.
000026      C*      SUBCAT - SUBCLASS-CATEGORY CORRESPONDENCE VECTOR
000027      C*      (SUBCAT(I)=M MEANS SUBCLASS I BELONGS TO CATEGORY M)
000028      C*      CLSSUB - SUBCLASS-CLASS CORRESPONDENCE VECTOR.
000029      C*      (CLSSUB(I)=M MEANS SUBCLASS I BELONGS TO CLASS M)
```



000030

000031

000032

000033

000034

000035

000036

000037

000038

000039

000040

000041

000042

000043

000044

000045

000046

000047

000048

000049

000050

000051

000052

000053

000054

000055

000056

000057

000058

000059

000060

000061

C* NOMAP - TRIGGER INDICATING WHETHER OR NOT A MAP IS TO BE PRINTED

C* TOTVT3 - TOTAL NO. OF VERTICES IN INPUT TEST FIELDS,

C* NOSUB3 - NO. OF SUBCLASSES USED IN CLASSIFY PLUS ONE, FOR THE

C* THRESHOLD CLASS.

C* PCFKEY - KEY INDICATING WHETHER OR NOT GROUND TRUTH PERFORMANCE

C* REPORTS ARE TO BE PRINTED ON A PER FIELD BASIS.

C* TSTKEY - KEY INDICATING WHETHER OR NOT TEST FIELDS WERE INPUT.

C* TANKEY - KEY INDICATING WHETHER OR NOT TRAINING FIELDS ARE TO

C* BE OUTLINED.

C* THASKY - THRESHOLD KEY

C* =1 APPLY CHI-SQUARE THRESHOLDS

C* =2 APPLY EMPIRICAL THRESHOLDS

C* =3 APPLY USER-INPUT THRESHOLDS

C* =4 APPLY FISHER DISTRIBUTION THRESHOLD

C* =0 NO THRESHOLDING

C* STATKY - KEY FOR PRINTING STATS FROM MAPTAP

C* EMPIAS - EMPIRICAL THRESHOLDING FLAG

C* THASVA - USER-INPUT THRESHOLD VALUE FLAG

C* PLTKEY - FLAG FOR PRINTING CUMULATIVE HISTOGRAMS OF QUADRATIC

C* FORM.

C* BMFLG - FLAG INDICATING WHETHER OR NOT A B-MATRIX WAS

C* APPLIED IN CLASSIFY.

C* BMCOMB - NO. OF LINEAR COMBINATIONS IN B-MATRIX

C* BMFEAT - NO. OF CHANNELS USED IN COMPUTING B-MATRIX

C* CDATE - DATE OF CLASSIFICATION

C* FLD5V2 - ADDRESS IN 'ARRAY' FOR TRAINING FIELD INFORMATION,

C* FOR EACH TRAINING FIED 4 PIECES OF INFORMATION ARE

C* STORED - 1=FIELD NAME

C* 2=CLASS NO.

C* 3=SUBCLASS NO.

C* 4=NO. OF VERTICES

C* FIEL02 - ADDRESS IN 'ARRAY' FOR RECTANGULAR AREA SURROUNDING



000062
000063
000064
000065
000066
000067
000068
000069
000070
000071
000072
000073
000074
000075
000076
000077
000078
000079
000080
000081
000082
000083
000084
000085
000086
000087
000088
000089
000090
000091
000092
000093

C* EACH TRAINING FIELD. FOR EACH TRAINING FIELD 5 PIECES
C* OF INFORMATION ARE STORED.
C* 1=LINE START
C* 2=LINE END
C* 3=SAMPLE START
C* 4=SAMPLE END
C* 5=POINTER INTO VERTEX ARRAY FOR VERTICES
C* OF THIS FIELD.
C* VERTX2 - ADDRESS IN 'ARRAY' FOR TRAINING FIELD VERTICES.
C* FLDV3 - SAME AS FLDV2 FOR TEST FIELDS
C* FIELD3 - SAME AS FIELD2 FOR TEST FIELDS
C* VERTX3 - SAME AS VERTX2 FOR TEST FIELDS
C* PCT103 - ADDRESS IN 'ARRAY' FOR PERFORMANCE TABLE.
C* THRES - THRESHOLD VALUES
C* SYMTE - SYMBOLS FOR EACH SUBCLASS, PLUS THRESHOLD SYMBOL
C* AND OUTLINE SYMBOLS.
C* HIGH - THRESHOLD REJECTION PERCENTAGE - EMPIRICAL OPTION
C* CON - CONSTANT FACTOR FROM PROBABILITY DENSITY FUNCTION
C* FROM CLASSIFY, ONE FOR EACH SUBCLASS.
C* FLDKEY - KEY INDICATING WHETHER GROUND TRUTH FIELDS ARE
C* ASSOCIATED WITH CLASSES OR SUBCLASSES.
C* NOFLD2 - NO. OF TRAINING FIELDS
C* NOFLD3 - NO. OF TEST FIELDS
C* NOFET2 - NO. OF CHANNELS USED IN CLASSIFICATION.
C* FETVC2 - CHANNELS USED IN CLASSIFICATION.
C* NOSUB2 - NO. OF SUBCLASSES USED IN CLASSIFICATION.
C* NOTAFD - NO. OF GROUND TRUTH FIELDS FOR WHICH PERFORMANCE
C* TABLES WILL BE MADE, EQUALS NOFLD3 OR NOFLD2.
C* TOTVT2 - TOTAL NO. OF VERTICES FOR TRAINING FIELDS.
C* NOCLS2 - NO. OF CLASSES USED IN CLASSIFICATION.
C* KATND - CLASS - CATEGORY CORRESPONDENCE VECTOR
C* (KATND(I)=M MEANS CLASS I IS IN CATEGORY M)

000094

000095

000096

000097

000098

000099

000100

000101

000102

000103

000104

000105

000106

000107

000108

000109

000110

000111

000112

CHBK10

PROCEDURE

C* NOCAT - NO. OF CATEGORIES.
C* FILTER - FLAG FOR SPATIAL FILTERING OPTION.
C* MAPFMT - FORMAT FOR OUTPUT MAP TAPE
C* DESKEY - KEY INDICATING WHETHER OR NOT DESIGNATED FIELDS WERE INPUT
C* DESUNI - NO. FOR DESIGNATED UNIDENTIFIABLE (NOSUB2+5)
C* DESOTH - NO. FOR DESIGNATED OTHER (NOSUB2+6)
C* CROP - NAME OF CROP FOR WHICH INTENSIVE TEST SITE SUMMARY
C* REPORT IS TO BE PRINTED, CROP IS TO BE COMPARED WITH OTHER
C* ACROP - ACRES OF 'CROP' - USER INPUT
C* AOTHER - ACRES OF 'OTHER' - USER INPUT
C* ATOTAL - TOTAL ACRES IN CLASSIFIED SEGMENT
C* SITE - NAME OF SITE (CLASSIFIED SEGMENT)
C* ANALYS - NAME OF ANALYST PERFORMING STUDY
C* CAMS - NAME OF PROCEDURE CONFIGURATION USED IN STUDY
C* CAPKEY - KEY FOR GENERATING INTENSIVE TEST SITE SUMMARY REPORT
C* KPPPTS - TOTAL NUMBER PIXELS IN EACH SUBCLASS
C*
C*

END

12 NOV 75 17:48:49 0 01446502 14 110 DELETE
1 01451506 12 1

ORIGINAL PAGE IS
OF POOR QUALITY



FOR, CLSFY1, CLSFY1
UNIVAC 1160 FORTRAN V EXEC 1, LEVEL 254 - (EXEC0 LEVEL 0120100104)
THIS COMPILATION WAS DONE ON 03 NOV 76 AT 16:35:46

03 NOV 76

16

-136.136

4 I=1, NOSUB2), (KATNO(I), I=1, NOCLS2), (KEPPTS(I),
5 I=1, NOSUB2)

SUBROUTINE CLSFY1 ENTRY POINT 000627

STORAGE USED: CODE(1) 001611; DATA(0) 000437; BLANK COMMON(2) 000000

COMMON BLOCKS:

0003 INFORM 001154
0004 CLASS 000723
0005 SCRACH 030324
0006 GLOBAL 000075

EXTERNAL REFERENCES (BLOCK, NAME)

0007 RELEARN
0010 WRTFLD
0011 THRESH
0012 WRTATE
0013 MCMLSK
0014 EXIT
0015 NWBUS
0016 NIO13
0017 NIO23
0020 NWDUS
0021 NERR33
0022 ALOG

STORAGE ASSIGNMENT (BLOCK, TYPE, RELATIVE LOCATION, NAME)

0001	001013	100L	0000	000122	110F	0001	000102	1423	0001	000110	146G	0000	000131	150F
0001	000116	152G	0001	000124	156G	0000	000135	160F	0001	001104	161L	0000	000142	1611F
0001	000132	162G	0001	001111	162L	0001	000132	164G	0001	000140	171G	0001	000140	173G
0001	001133	182L	0000	000152	1800F	0001	001213	183L	0001	001237	195L	0000	000044	20F
0001	000145	205G	0001	001375	200L	0001	000152	204G	0000	000217	205F	0001	000160	210G
0001	000165	214G	0000	003235	220F	0001	001446	230L	0001	000240	236G	0001	000315	266G
0001	000223	271G	0001	000336	275G	0001	000347	302G	0001	000362	306G	0001	000447	323G
0001	000517	333G	0001	000526	340G	0001	000724	371G	0001	000724	373G	0000	000074	40F
0001	000732	400G	0001	000732	402G	0001	000763	416G	0001	000767	422G	0001	001033	445G
0001	001064	454G	0000	000076	50F	0001	001142	502G	0001	001160	505G	0001	001264	534G
0001	001276	536G	0001	001305	543G	0001	001312	547G	0001	001344	562G	0001	001351	566G
0000	000103	65F	0001	000537	611L	0001	000601	612L	0000	000107	65F	0000	000031	65F
0005 R	000326	APR	0004 I	000000	APRFLG	0006 I	000073	ASAV	0006 I	000074	ASAVFL	0003 I	000006	AVARZ
0000 I	000020	BACFLG	0000 I	000001	BCDFOR	0000 I	000000	BCDTW0	0004 I	000001	BMCOMB	0004 I	000002	BMFEAT
0006 I	000055	BMFILE	0004 I	000003	BMFLG	0006 I	000056	BMKEY	0005 R	000036	BKXKBT	0005 I	000014	C
0004 I	000011	CATNAM	0004 I	000065	CHNVEC	0003 I	000010	CLSID2	0004 I	000105	CLSSYM	0003 I	000301	CLSV2
0000 I	000021	CNT	0004 R	000201	CON	0005 R	000427	COV	0003 I	000007	COVAR2	0000 I	000002	DASH
0006 I	000053	DATAP	0006 I	000071	DATFIL	0004 R	000275	DET	0006 I	000067	DRMWD5	0006 I	000366	DRUMAD
0005 R	000230	DJM	0006 I	000062	ERIPTP	0006 I	000063	ERPKEY	0003 I	000015	FETVC2	0004 I	000311	FLDESC
0004 I	000372	FLOINP	0003 I	000013	FLOSV2	0003 I	000760	GROUPS	0003 I	000663	GRPCHK	0003 I	000566	GRPDEX



0003 I 000472 GRPNAM	0006 I 000200 HEAD	0006 I 000057 MISFIL	0006 I 000060 MISKEY	0000 I 000005 I
0000 I 000023 ICLAS	0004 I 001006 IDATA1	0000 I 000007 II	0000 I 000017 III	0000 I 000022 INC
0000 I 000320 INJPA	0000 I 000313 INJPA	0000 I 000006 J	0000 I 000015 K	0004 I 000400 KCLSHA
0003 I 000375 KEPPTS	0000 I 000027 L	0000 I 000025 LOC	0000 I 000003 LPMN	0006 I 000052 MAPTAP
0006 I 000064 MAPUNT	0003 I 000011 NCLS	0004 I 000007 NFILE	0004 I 000004 NOCAT	0000 I 000004 NOCAT1
0004 I 000064 NOCHAN	0003 I 000000 NOCLS2	0004 I 000474 NOCTCL	0003 I 000402 NOFET2	0006 I 000065 NOFILE
0003 I 000005 NOFLO2	0003 I 000471 NOGRP	0003 I 000001 NOSUB2	0000 I 000016 NPL1	0000 I 000030 NSUBCL
0000 I 000024 NUMSUB	0006 I 000070 PAGSIZ	0000 I 000012 R	0007 R 000000 RELEARN	0005 R 000327 REARROR
0000 I 000013 RRM102	0006 I 000054 SAVTAP	0005 I 000000 SCAL	0005 I 000720 SCR2	0006 I 000072 STAFIL
0004 I 000010 STATKY	0000 I 000026 STOP	0004 I 000570 SUBCAT	0003 I 000012 SUBU72	0003 I 000011 SUBNO2
0003 I 000164 SUBPTH	0003 I 000053 SUBVC2	0005 R 000224 SUM	0005 R 000227 SUMTR	0000 I 000010 TEMPF2
0004 I 000005 TH11	0003 I 000004 TOTVT2	0006 I 000061 TFORM	0003 I 000003 VAR522	0005 R 000000 VEC
0003 I 000014 VERTX2				

00100	1*	C	//CLSFYI	CLSFO000
00101	2*		SUBROUTINE CLSFYI(COVMTX,AVENTX,FLOMTX,CLSMX,APRIOR,	
00101	3*		= BMATX,VERTEX,SUBDES,SUBNO,COVNEW,AVENUE,KATNO)	
00101	4*	C		
00101	5*	C		
00103	6*		IMPLICIT INTEGER (A-M,O-Z)	CLSFO020
00103	7*	C		CLSFO030
00103	8*	CI	-----	ICLSFO040
00103	9*	CI	-----	ICLSFO050
00103	10*	CI		ICLSFO060
00103	11*	CI	CALL... CALL CLSFYI(COVMTX,AVENTX,FLOMTX,RUNMTX,CLSMX,APRIOR,	
00103	12*	CI	BMATX,COVNEW,AVENUE)	
00103	13*	CI		ICLSFO080
00103	14*	CI	ARGS... COVMTX : LOCATION OF COVARIANCE MATRICES (SYMMETRIC	
00103	15*	CI	STORAGE) FOR NOCLS2 TRAINING CLASSES.	
00102	16*	CI		
00103	17*	CI	AVENTX : LOCATION OF NOCLS2 TRAINING CLASS MEAN VECTORS	
00103	18*	CI	(NOFET2 MEANS PER CLASS)	
00103	19*	CI		
00103	20*	CI	FLOMTX : LOCATION OF TRAINING FIELD(S) INFORMATION	
00103	21*	CI		
00103	22*	CI	CLSMX : LOCATION OF NAME FOR EACH CLASS	
00103	23*	CI		
00103	24*	CI	APRIOR : LOCATION OF APRIORI PROBABILITY VALUES FOR	
00103	25*	CI	EACH CLASS	
00103	26*	CI		
00103	27*	CI	VERTEX : LOCATION OF VERTICES OF SAVED TRAINING FIELDS	
00103	28*	CI		
00103	29*	CI	SUBDES : LOCATION OF SUBCLASS NAMES	
00103	30*	CI		
00103	31*	CI	SUBNO : LOCATION OF ARRAY CONTAINING NO. OF SUBCLASSES IN	
00103	32*	CI	EACH CLASS	
00103	33*	CI	COVNEW : LOCATION USED TO STORE 'B'-TRANSFORMED	
00103	34*	CI	COVARIANCE MATRICES.	
00103	35*	CI		
00103	36*	CI	AVENUE : LOCATION USED TO STORE THE 'B'-TRANSFORMED	
00103	37*	CI	MEAN VECTORS.	
00103	38*	CI		
00103	39*	CI	BMATX : LOCATION OF THE 'B'-TRANSFORMATION MATRIX,	
00103	40*	CI	IF AVAILABLE, FOR APPLICATION TO THE CLASS	
00103	41*	CI	MEANS AND COVARIANCE MATRICES.	
00103	42*	CI		ICLSFO100
00103	43*	CI	KATNO : CATEGORY - CLASS CORRESPONDENCE	
00103	44*	CI		ICLSFO130
00103	45*	CI		
00103	46*	CI		

```

00103 47. CI PURPOSE...
00103 48. CI
00103 49. CI IF AVAILABLE, THE 'B'-TRANSFORMATION MATRIX IS APPLIED
00103 50. CI
00103 51. CI TO THE SUBCLASS MEAN VECTORS AND COVARIANCE MATRICES,
00103 52. CI OBTAINS THE (MODIFIED) CHOLESKY FACTORIZATION OF THE
00103 53. CI SUBCLASS COVARIANCE MATRICES, PROVIDES THE 'CONSTANT' OF
00103 54. CI THE PROBABILITY DENSITY FUNCTION AND DETERMINANT FOR
00103 55. CI EACH SUBCLASS, AND OBTAINS THE SUBCLASS-PAIR THRESHOLDS FOR
00103 56. CI USE BY SUBR. CONTEX IN CLASSIFICATION OF INPUT SCAN
00103 57. CI LINES, PUBLISHES AND OUTPUTS ON MAPTAP THE TRAINING
00103 58. CI FIELD(S) INFORMATION AND THE STATISTICS FOR EACH OF THE
00103 59. CI TRAINING CLASSES.
00103 60. CI ICLSF0060
00103 61. CI RETURNS...CHOLESKY FACTORIZATION OF THE INPUT COVARIANCE MATRICES
00103 62. CI (AFTER 'B'-TRANSFORMATION', IF APPLICABLE), SUBCLASSPAIR
00103 63. CI THRESHOLDS, AND SUBCLASS STATISTICS OUTPUT ON MAPTAP.
00103 64. CI ICLSF0180
00103 65. CI -----ICLSF0190
00103 66. CI -----ICLSF0200
00103 67. C CLSF0210
00103 68. C CLSF0220
00103 69. C CLSF0230
00104 70. C INCLUDE COMAK1,LIST
00104 71. C CLSF0350
00104 72. C CLSF0450
00104 73. C -----CLSF0460
00104 74. C CLSF0470
00105 74. C
00105 74. C COMMON/INFORM/NOCLS2,NOSUB2,NOFET2,VARSZ2,TOTVT2,NOFLD2,
00105 74. C * AVAR2,COVAR2,CLSI02,SUBV02,SURD52,FLDSV2,VERTX2,
00105 74. C * FETVC2(30),SUBVC2(75),SURPTR(75),CLSV2(60),
00105 74. C * REPTS(60),NOGAP,GAPNAM(60),GAPDEX(61),
00105 74. C * GAPCHK(61),GROUPS(124)
00106 74. C END
00107 75. C INCLUDE COMAK2,LIST
00107 76. C CLSF0510
00107 77. C CLSF0530
00107 78. C -----CLSF0540
00107 79. C CLSF0550
00110 79. C COMMON /CLASS/ APRFLG,BNCOMB,BMFEAT,BMFLG,NOCAT,THIJI,DATAI,
00110 79. C * NFILE,SEATKY,CATNAM(60),
00110 79. C * CLSSYM(60),CON(60),DET(60),FLDESC,FLDINF(6),
00110 79. C * KCLSNM(60),NOCTCL(60),SUBCAT(60)
00110 79. C * ,NOCHAN,CNNVEC(30) *NEW
00110 79. C
00111 79. C END
00112 80. C REAL CON,DET,COVMTX(VARSZ2,NOSUB2)
00113 81. C REAL AVEMTX(NOFET2,NOSUB2),APR1OR(1),VEC(30),BKXBT(120)
00113 82. C
00114 83. C REAL SUM,SUMTR,DUM(60),REARR(60),APR,CDF(465)
00114 84. C
00115 85. C REAL RELERR
00115 86. C
00115 87. C -----
00115 88. C
00116 89. C COMMON /SCRACH/SCRI(2000),SCR2(10500)
00116 90. C
00116 91. C -----
00116 92. C
00116 93. C
00117 94. C EQUIVALENCE ( VEC(1), SCRI(1) ), ( BKXBT(1), SCRI(31) ),
00117 95. C
00117 96. C ( SUM, SCRI(15) ), ( SUMTR, SCRI(152) )

```

ORIGINAL PAGE IS
OF 100

23

```

00117 97. C
00117 98. B , ( BUN(1), SCAL(153)), ( APR, SCAL(215) )
00117 99. C
00117 100. 3 , (ACRADD(1), SCAL(216)), (COV(1), SCAL(200))
00117 101. C
00117 102. C
00120 103. DIMENSION CLSMX(1), FLOMTX(4, NOFLD2), SUBNO(1), SUBDES(1),
00120 104. * VERTEX(2, TOTVT2), KATNO(1)
00120 105. C
00121 106. DATA BCDTMO/ '2' / , BCDPCR/ '4' / , DASH/ '-----' / CLSF0640
00125 107. DATA LPAN/ ' ' /
00125 108. C
00125 109. C
00125 110. C
00125 111. C
00125 112. C
00125 113. C
00127 114. REAL BMATA(BMCOMB, BMFEAT)
00127 115. C
00130 116. REAL AVENUE(BMCOMB, BMFEAT), COVNEW(BMFLG, NOSUB2)
00130 117. C
00130 118. C
00130 119. C
00130 120. C
00130 121. C
00131 122. INCLUDE COMBK6, LIST
00131 123. C
00131 124. C
00132 124. COMMON/GLOBAL/HEAD(42), MAPTAP, DATAP, SAVTAP, BMFILE, BMKEY,
00132 124. * MISFIL, MISKEY, TRFORM, FRIPF, ERKKEY, MAPUNT, NOFILE,
00132 124. * DRUMAD, DRUMDS, PAGESZ, DATFIL, STAFIL, ASAV, ASAVFL
00133 124. END
00134 125. C
00134 126. C
00134 127. C
00134 128. C
00134 129. C
00134 130. IF (NOCAT .GT. 0) NOCAT1 = NOCAT
00136 131. IF ( NOCAT .LE. 0 ) NOCAT1 = NOCLS2
00140 132. WRITE(MAPTAP) (CATNAM(1), I=1, NOCAT1), (CLSMX(1), I=1, NOCLS2),
00140 133. 1 (SUBNO(1), I=1, NOCLS2), (SUBDES(1), I=1, NOSUB2),
00140 134. 2 ((FLOMTX(1, J), I=1, 4), J=1, NOFLD2), ((VERTEX(1, J), I=1, 2),
00140 135. 3 J=1, TOTVT2), (SUBCAT(1), I=1, NOSUB2), (CLSV2(1),
00140 136. 4 I=1, NOSUB2), (KATNO(1), I=1, NOCLS2), (KEPPTS(1), *NEW
00140 137. 5 I=1, NOSUB2) *NEW
00140 138. C
00140 139. C
00140 140. C
00140 141. C
00220 142. 65 FORMAT(3X, '*** CLASSIFICATION STUDY *** MAPTAP FILE ', 5X, 12//)
00221 143. 10 CALL WRFLD(FLOMTX, VERTEX, NOFLD2, 1, CLSMX, SUBDES)
00221 144. C
00221 145. C
00221 146. C
00221 147. C
00221 148. C
00222 149. WRITE(6, HEAD)
00224 150. WRITE(6, 65) NFILE
00227 151. WRITE(6, 26)
00231 152. 20 FORMAT( 11//T27, 'SUBCLASSES CONSIDERED', T90, 'CHANNELS CONSIDERED'
00231 153. *//T21, 'SYMBOL', T32, 'SUBCLASS', T45, 'A PRIOR', T88, 'TRAINING RECOGN
00231 154. *ITION')
00232 155. 11 = NOSUB2

```

```

00233 156. IF ( II .LT. NOFET2 ) II = NOFET2
00235 157. DO 30 I=1,II
00240 158. WRITE (6,90)
00242 159. IF ( I .LE. NOSUB2 ) WRITE(6,50)CLSSYM(I),SUBDES(I),APRION(I)
00250 160. IF ( I .LE. NOFET2 ) WRITE(6,60)FETVC2(I),CMNVEC(I)
00255 161. 30 CONTINUE
00257 162. 40 FORMAT(' ')
00260 163. 50 FORMAT(' ',T23,A1,T33,A6,T45,F7.4)
00261 164. 60 FORMAT(' ',T91,I2,T103,I2)
00261 165. C
00261 166. C SAVE AND PUBLISH THE MEAN AND COVARIANCE
00261 167. C
00261 168. C
00261 169. C
00261 170. C IF B-MATRIX IS AVAILABLE, TRANSFORM THE COVARIANCE MATRIX AND
00261 171. C MEAN VECTOR
00261 172. C
00261 173. C
00262 174. TEMPF2 = NOFET2
00263 175. IF( BMFLG .LE. 0 ) GO TO 611
00265 176. DO 610 NCLS=1,NOSUB2
00270 177. DO 605 R=1,BNCOMB
00273 178. RRM102 = ( R + (R-1) ) / 2
00274 179. DO 603 C=1,R
00277 180. I = RRM102 + C
00300 181. SUMTA = 0.0
00301 182. DO 602 J=1,NOFET2
00304 183. SUM = 0.0
00305 184. DO 601 K=1,NOFET2
00310 185. II = ( K + (K-1) ) / 2 + J
00311 186. IF( J .GT. K ) II = ( J + (J-1) ) / 2 + K
00313 187. 601 SUM = SUM + BMATR(R,K) * COVMTA(II,NCLS)
00315 188. 602 SUMTA = SUMTA + BMATR(C,J) * SUM
00317 189. 603 BXXBT(I) = SUMTA
00321 190. SUM = 0.0
00322 191. DO 604 J=1,NOFET2
00325 192. 604 SUM = SUM + BMATR(R,J) * AVEMTA(J,NCLS)
00327 193. VEC(R) = SUM
00330 194. 605 CONTINUE
00332 195. DO 606 J=1,I
00335 196. COVNEW(J,NCLS) = BXXBT(J)
00337 197. DO 607 J=1,BNCOMB
00342 198. AVENEW(J,NCLS) = VEC(J)
00344 199. 610 CONTINUE
00346 200. VARSZ2 = BMFLG
00347 201. NOFET2 = BNCOMB
00350 202. 611 CALL CLSFIA(COVMTA,AVEMTA,VARSZ2,NOFET2,NOSUB2)
00351 203. CONTINUE
00351 204. C
00351 205. C OBTAIN THE SUBCLASS-PAIR THRESHOLDS, FOR USE BY CLSFY2/CONTEX
00351 206. C
00351 207. C
00352 208. IF (NOCAT .GT. 0) GO TO 612
00354 209. NPL1 = NOFET2 + 1
00355 210. CALL THRESH(NOSUB2,NOFET2,NPL1,APRION,AVEMTA,COVMTA,DET,VARSZ2,
00355 211. 1 SCR2(1),SCR2(901),SCR2(1801),SCR2(1831),SCR2(1861),
00355 212. 2 SCR2(2791),SCR2(1711))
00356 213. 612 CONTINUE
00356 214. C
00356 215. C
00357 216. NOFET2 = TEMPF2
00360 217. RETURN
00360 218. C

```

CLSF0880

CLSF0890

CLSF0920

CLSF0930

CLSF1120

CLSF1130

CLSF1140

CLSF1150

```

00360 219. C *** END - CLSFV) ***
00360 220. C
00360 221. C -----
00360 222. C
00360 223. C
00360 224. C INTERNAL SUBROUTINE CLSF14
00360 225. C
00360 226. C
00360 227. C
00360 228. C
00361 229. C SUBROUTINE CLSF14(COVMX,AVENTX,VAR522,NOFET2,NOSUB2)
00361 230. C
00364 231. C INTEGER VAR522
00364 232. C
00365 233. C REAL COVMX(VAR522,NF,102),AVENTX(NOFET2,NOSUB2)
00366 234. C III = 0
00366 235. C
00366 236. C
00366 237. C
00366 238. C -----
00366 239. C
00366 240. C OUTPUT THE ORIGINAL COVARIANCE AND MEAN MATRIX AFTER B-TRANSFORM
00366 241. C IF B-MATRIX AVAILABLE) FOR ALL SUBCLASSES, ON THE CLASSIFICATION
00366 242. C RESULTS OUTPUT FILE, MAPTAP
00366 243. C
00366 244. C -----
00366 245. C
00366 246. C HEADER RECORD NO. 3 FOR MAPTAP
00366 247. C
00367 248. C WRITE(MAPTAP) ((COVMX(I,J),I=1,VAR522),J=1,NOSUB2),
00367 249. C ((AVENTX(I,J),I=1,NOFET2),J=1,NOSUB2)
00367 250. C
00407 251. C BADFLG = 0
00407 252. C
00410 253. C IF (STATV.EQ.0) GO TO 180
00412 254. C CNT = 7*(5+3+2*NOFET2+1*(NOFET2+11)/12)
00413 255. C CNT = PAGESZ/CNT
00414 256. C INC = CNT
00415 257. C DO 170 ICLAS=1,NOCL52
00420 258. C NUMSUB = SUBNO(ICLAS)
00421 259. C DO 120 II=1,NUMSUB
00424 260. C III = III + 1
00425 261. C IF (INC.LT.CNT) GO TO 100
00427 262. C WRITE (6,HEAD)
00431 263. C WRITE(6,65)INFILE
00434 264. C 65 FORMAT(3X,'*** CLASSIFICATION STUDY *** MAPTAP FILE ',5X,12//)
00435 265. C INC = 0
00436 266. C 100 CONTINUE
00437 267. C WRITE(6,110) CLSMX(ICLAS),SUBDES(III)
00443 268. C 110 FORMAT(/// CLASS : 'A6/' SUBCLASS: ',A6 )
00444 269. C DO 140 LOC=1,NOFET2,12
00447 270. C STOP = LOC+11
00450 271. C IF( STOP .GE. NOFET2 ) STOP = NOFET2
00452 272. C 140 WRITE(6,150) ( AVENTX(I,III),I=LOC,STOP)
00461 273. C 150 FORMAT('0 MEAN:',3X,12F9.2)
00461 274. C
00462 275. C IF( BMFLG .GT. 0 ) GO TO 161
00464 276. C WRITE(6,160)
00466 277. C 160 FORMAT(/// COVARIANCE MATRIX: ')
00467 278. C GO TO 162
00470 279. C 161 WRITE(6,1611)
00472 280. C 1611 FORMAT(/// COVARIANCE MATRIX (B-TRANSFORMED) : ')
00473 281. C 162 CALL WRITMX(COVMX(1,III),NOFET2, ACOTWO)

```

ORIGINAL PAGE IS
OF POOR QUALITY

CLSF1100
CLSF1190
CLSF1200
CLSF1210
CLSF1220

CLSF1230
CLSF1240

CLSF1260

CLSF1290
CLSF1300
CLSF1310

```

00474 282*      INC = INC+1                                CLSF1420
00475 283*      120 CONTINUE
00477 284*      170 CONTINUE                                CLSF1430
00477 285*      C                                          CLSF1440
00477 286*      C
00477 287*      C OBTAIN THE "MODIFIED" CHOLESKY DECOMPOSITION OF THE COVARIANCE
00477 288*      C MATRIX FOR EACH SUBCLASS, THE DETERMINANT, AND COMPUTE THE
00477 289*      C "CONSTANT" TERM OF THE PROBABILITY DENSITY FUNCTION
00477 290*      C = -2 * LOG Q(1) + LOG DETERMINANT(1), WHERE Q(1) IS THE
00477 291*      C APRIORI PROBABILITY VALUE FOR SUBCLASS 1
00477 292*      C
00477 293*      C PDF = Q(1) * ( DET(1)**-1/2 * E**1/2 * (X-M)** * K**1 * (X-M) )
00477 294*      C
00477 295*      C LOG PDF = -1/2 * ( CON + (X-M)** * K**1 * (X-M) )
00477 296*      C
00477 297*      C
00477 298*      C
00501 299*      100 DO 195 NCLS=1,NOSUB2
00501 300*      C
00501 301*      C TRANSFER ORIGINAL COVARIANCE MATRIX TO TEMPORARY STORAGE ( COV )
00501 302*      C
00504 303*      DO 101 I=1,VAR522
00507 304*      101 COV(I) = COVATX(I,NCLS)
00507 305*      C
00507 306*      C OBTAIN THE "MODIFIED" CHOLESKY FACTORIZATION OF THE
00507 307*      C COVARIANCE MATRIX
00507 308*      C
00511 309*      C CALL MCMLS( COVATX(I,NCLS), NOFET2, DUM, DET(NCLS) )
00511 310*      C
00512 311*      C IF( DET(NCLS) .GT. 0.0 ) GO TO 103
00514 312*      C WRITE(6,1000) NCLS, DET(NCLS)
00520 313*      1000 FORMAT(/// 5X,'***** CLSFY/CLSFY/CLSFIA --- THE COVARIANCE MAT
00520 314*      101X,FOR SUBCLASS NO',I4,' IS EITHER SINGULAR OR NOT POSITIVE DEFIN
00520 315*      21X,/// 35X,'DETERMINANT =',F20.4///5X,'***** TERMINATING PROGRAM
00520 316*      3 EXECUTION *****' )
00520 317*      C
00521 318*      C BADFLG = 99
00522 319*      C GO TO 195
00523 320*      103 APR = APRIOR(NCLS)**-2
00524 321*      C CON(NCLS) = ALOG( APR * DET(NCLS) )
00524 322*      C
00524 323*      C
00524 324*      C OBTAIN THE RELATIVE ERROR OF FACTORED MATRIX ( RATIO OF
00524 325*      C EUCLIDEAN NORM OF DIFFERENCE, K-LDL* , TO EUCLIDEAN NORM OF K )
00524 326*      C
00525 327*      C RERROR(NCLS) = RELERR( COVATX(I,NCLS),COV,NOFET2,VAR522 )
00525 328*      C
00525 329*      C
00526 330*      195 CONTINUE
00526 331*      C
00526 332*      C ERROR TERMINATION, IF ONE OR MORE SUBCLASSES HAVE AN INVALID
00526 333*      C (SINGULAR, OR NON-POSITIVE DEFINITE) COVARIANCE MATRIX
00526 334*      C
00530 335*      C IF( BADFLG .GT. 0 ) CALL EXIT
00530 336*      C
00530 337*      C
00530 338*      C
00530 339*      C
00530 340*      C -----
00530 341*      C OUTPUT THE ( MODIFIED ) CHOLESKY FACTORIZATION OF THE
00530 342*      C COVARIANCE MATRIX, ON THE CLASSIFICATION OUTPUT FILE, MAPTAP
00530 343*      C -----
00530 344*      C

```



```
00530 345. C   HEADER RECORD NO. 4 FOR MAPTAP
00530 346. C
00532 347.   WRITE(MAPTAP) ((COVMTR(I,J),I=1,VAR522),J=1,NOSUB2),
00532 348.   *   (CON(I),I=1,NOSUB2),(DET(I),I=1,NOSUB2)
00553 349.   IF (STATKY.EQ.0) GO TO 230
00555 350.   CNT = 13 + (5*2-NOFET2) + ((NOFET2+1)/12)
00556 351.   CNT = PAGESZ/CNT
00557 352.   INC = CNT
00557 353. C
00560 354.   III = 0
00561 355.   DO 210 L=1,NOCLS2
00564 356.   NSUBCL = SUBNO(L)
00565 357.   DO 210 I=1,NSUBCL
00570 358.   III = III + 1
00571 359.   IF (INC.LT.CNT) GO TO 200
00573 360.   WRITE (6,HEAD)
00575 361.   WRITE(6,65)INFILE
00600 362.   INC = 0
00601 363. 200 WRITE(6,220)CLSMTR(L),L,SUBDES(III),III,DET(III),CON(III)
00611 364.   CALL WRTMTR(COVMTR(I,III),NOFET2,BCDFOR)
00611 365. C
00612 366.   WRITE(6,205)ERROR(III)
00615 367. 205 FORMAT(IX,'** RELATIVE ERROR ( EUCLIDEAN NORM (K-LDL)/EUCLIDEAN
00615 368.   INORM K ) =',F15.8 // )
00615 369. C
00616 370.   INC = INC+1
00617 371. 210 CONTINUE
00622 372. 220 FORMAT(1H0// T50,'MULTISPECTRAL CHARACTERISTICS FOR',/ T57,A6,
00622 373.   1' ( CLASS',I3,' ',/T56,A6,' ( SUBCLASS',I3,' ' )//
00622 374.   2 1H0,'DETERMINANT =',F25.4 / 1H0, 'PROB. DENSITY FU
00622 375.   2NCTION - CONSTANT TERM=',F10.4// 1H0,'COVARIANCE MATRIX (CHOLESKY
00622 376.   3 FACTORIZATION) : ' / )
00622 377. C
00622 378. C
00623 379. 230 CONTINUE
00623 380. C
00624 381.   RETURN
00625 382.   END
```

CLSF1520

CLSF1540

CLSF1550

CLSF1570

CLSF1580

CLSF1600

CLSF1630

CLSF1640

CLSF1730

END OF COMPILATION: NO DIAGNOSTICS.
CLSFV1 SYMBOLIC
CLSFV1 CODE RELOCATABLE

16 AUG 76	14:14:24	0	01555172	14	381	(DELETE
16 AUG 76	14:14:24	1	01567520	48	1	(DELETE
		0	01567600	14	111	



* FOR, * DISPLAY, DISPLAY
UNIVAC 1108 FORTRAN V EXEC 11 LEVEL 25A -(EXEC8 LEVEL E12010010A)
THIS COMPILATION WAS DONE ON 03 NOV 76 AT 16:36:20

03 NOV 76

16:31

-51

C-

C- TEST THRSKY = 4 FOR FISHER F-DISTRIBUTION THRESHOLDS

C- CALL FDIST TO COMPUTE AND STORE THRESHOLDS

C-

IF (THRSKY.EQ.4) CALL FDIST

C-

SUBROUTINE DISPLAY ENTRY POINT 000272

STORAGE USED: CODE(1) 000307; DATA(0) 000040; BLANK COMMON(2) 000000

COMMON BLOCKS:

0003 DISPL 001463

EXTERNAL REFERENCES (BLOCK, NAME)

0004 SETUP3
0005 DSPLY1
0006 EMHRS
0007 FDIST
0010 DSPLY2
0011 PRTPCT
0012 NWDUS
0013 NIO2s
0014 NERR3s

STORAGE ASSIGNMENT (BLOCK, TYPE, RELATIVE LOCATION, NAME)

0001	000037	10L	0000	000000	100F	0001	000127	30L	0003	001342	ACROP	0003	001351	ANALYS
0003	001343	ADTHER	0003	001344	ATOTAL	0003	000570	BMCOMB	0003	000571	BMFEAT	0003	000567	BMFLG
0003	001354	CAM	0003	000000	CATFLG	0003	000001	CATNAM	0003	000572	CDATE	0003	000076	CLSNAM
0003	000460	CLSSUB	0003	001075	CON	0003	001341	CRCP	0003	001366	CRPKEY	0003	001336	DESKEY
0003	001340	DESOTH	0003	001337	DESUM1	0003	000564	EMPTAS	0003	001175	FETVC2	0003	000575	FIELD2
0003	000600	FIELD3	0003	001334	FILTER	0003	001171	FLOKEY	0003	000574	FLOSV2	0003	000577	FLOSV3
0003	001001	HIGH	0000	000020	INJPS	0003	001237	KATND	0003	001367	KEPPTS	0003	001335	MAPFMT
0003	001333	NOCAT	0003	001236	NOCLS2	0003	001174	NOFET2	0003	001172	NOFLD2	0003	001173	NOFLD3
0003	000554	NOMAP	0003	001233	NOSUB2	0003	000556	NOSUB3	0003	001234	NOTRFD	0003	000557	PCFDKY
0003	000602	PCTID3	0003	000566	PLTKEY	0003	001345	SITE	0003	000563	STATKY	0003	000364	SUBCAT
0003	000173	SUBNAM	0003	000270	SUBND	0003	000677	SYMMT1	0003	000603	THRES	0003	000562	THRSKY
0003	000565	THRSVA	0003	001235	TOTVT2	0003	000555	TOTVT3	0003	000561	TRNKEY	0003	000560	TSTKEY
0003	000576	VERT12	0003	000601	VERT13									

00100 1* C //DISPLAY

```

00101 20 SUBROUTINE DISPLAY(ARRAY,TOP)
00101 30 C SUP30020
00103 40 IMPLICIT INTEGER (A-H,O-Z) SUP30030
00103 50 C SUP30040
00103 60 C SUP30050
00104 70 DIMENSION ARRAY(1)
00104 80 C SUP30070
00104 90 C SUP30080
00104 100 C----- SUP30090
00104 110 C----- ISUP30100
00104 120 C----- ISUP30110
00104 130 C1 CALL, CALL DISPLAY(ARRAY,TOP)
00104 140 C1 ISUP30130
00104 150 C1 ARGS, ARRAY - SFE 'MONTOR' ISUP30140
00104 160 C1 TOP - SFE 'MONTOR' ISUP30150
00104 170 C1 ISUP30160
00104 180 C1 PURPOSE, COORDINATES ROUTINES FOR DISPLAYING CLASSIFICATION
00104 190 C1 MAP AND PERFORMANCE TABLES,
00104 200 C1 ISUP30230
00104 210 C1----- ISUP30240
00104 220 C1----- ISUP30250
00104 230 C SUP30260
00105 240 INCLUDE CMR10,LIST
00105 250 C*
00105 260 C* SETUP3 WILL READ FIRST 2 RECORDS FROM MAPTAP, AND CALL REDIF3
00105 270 C* TO READ IN CONTROL CARDS. ALL OF THE PARAMETERS IN COMMON BLOCK
00105 280 C* DISPL ARE INITIALIZE BEFORE RETURNING TO THIS ROUTINE IN ADDITION
00105 290 C* TRAINING AND/OR TEST FIELD DEFINITIONS WILL BE STORED IN 'ARRAY'
00105 300 C*
00106 300 COMMON/DISPL/CATFLG,CATNAM(61),CLSNAM(61),SUBNAM(61),SUBNO(60),
00106 300 * SUBCAT(60),CLSSUB(60),NOMAP,TOTVT3,NOSUB3,
00106 300 * PCFOKV,TSTKEY,TANKEV,THRSKY,STATKY,EMPTRS,THRSVA,
00106 300 * PLTKEY,BMFLG,BNCOMB,BNFEAT,COATE(2),
00106 300 * FLD5V2,FLD02,VERTX2,FLD5V3,FLD03,VERTX3,PCT103,
00106 300 * THRES(60),SYMNTX(66),HIGH(60),CON(60)
00106 300 * ,FLDKEY,NOFLO2,NOFLO3,NOFFT2,FETVC2(30)
00106 300 * ,NOSUB2,NOTRFD,TOTVT2,NOCLS2
00106 300 * ,KATNO(60),NOCAT,FILTER,MAPFMT
00106 300 * ,DESKEY,DESUNI,DESOTH,CROP ,ACROP,ADTHER,ATOTAL
00106 300 * ,SITE(4),ANALYS(3),CAM(10),CRPKEY,KEPPTS(60)
00107 300 END
00110 310 CALL SETUP3(ARRAY,TOP)
00110 320 C*
00110 330 C* DISPLY1 WILL READ NEXT 2 RECORDS FROM MAPTAP AND PRINT THE
00110 340 C* STATISTICS IF REQUESTED.
00110 350 C*
00111 360 CALL DISPLY1
00112 370 IF(EMPTRS.NE.2,AND. PLTKEY.NE.1)GO TO 30
00112 380 C*
00112 390 C* EMTHRS COMPUTES AND PLOTS THE HISTOGRAM OF THE QUADRATIC FORM
00112 400 C* FOR THE CORRECTLY CLASSIFIED PIXELS WITHIN THE TRAINING OR TEST
00112 410 C* FIELDS,
00112 420 C*
00114 430 IF(FLDKEY.EQ.1)GO TO 10
00114 440 WRITE(6,100)
00120 450 GO TO 30
00121 460 10 CONTINUE
00122 470 IF(TSTKEY.EQ.1)CALL EMTHRS(ARRAY(FLD5V3),ARRAY(FLD03),
00122 480 * ARRAY(VERTX3),NOFLO3)
00124 490 IF(TSTKEY.NE.1)CALL EMTHRS(ARRAY(FLD5V2),ARRAY(FLD02),
00124 500 * ARRAY(VERTX2),NOFLO2)
00126 510 30 CONTINUE
00126 520 C-

```

*NEW
***1

*NEW



```
00126 53* C- TEST THRSKY = 4 FOR FISHER F-DISTRIBUTION THRESHOLDS *NEW
00126 54* C- CALL FOIST TO COMPUTE AND STORE THRESHOLDS *NEW
00126 55* C- *NEW
00127 56* IF(THRSKY.EQ.4) CALL FOIST *NEW
00127 57* C- *NEW
00127 58* C-
00127 59* C- DSPLY2 PRINTS THE MAP AND CALLS PCT TO BUILD PERFORMANCE TABLES.
00127 60* C-
00131 61* CALL DSPLY2(ARRAY(FLOSV2),ARRAY(FIELD2),ARRAY(VERTX2),
00131 62* * ARRAY(FLOSV3),ARRAY(FIELD3),ARRAY(VERTX3),
00131 63* * ARRAY(PCT103))
00131 64* C-
00131 65* C- PRTPCT PRINTS THE PERFORMANCE TABLES
00131 66* C-
00132 67* IF(ISTKEY.EQ.1)CALL PRTPCT(ARRAY(FLOSV3),ARRAY(PCT103),NOFLD3)
00134 68* IF(ISTKEY.NE.1)CALL PRTPCT(ARRAY(FLOSV2),ARRAY(PCT103),NOFLD2)
00134 69* RETURN
00137 70* 100 FORMAT(/' **DISPLAY** - FIELDS MUST BE DEFINED FOR SURCLASSES FOR
00137 71* * EMPIRICAL THRESHOLDS'/)
00140 72* END SUP30740
```

END OF COMPILATION: NO DIAGNOSTICS.
DSPLAY SYMBOLIC
DSPLAY CODE RELOCATABLE

16 AUG 76	14:15:06	0	01700162	14	66	(DELETE
16 AUG 76	14:15:06	1	01702016	36	1	(DELETE
		0	01702062	14	22	



FOR FDISY, FDISY
UNIVAC 1100 FORTAN V EXEC 11 LEVEL 254 - (EXEC0 LEVEL E12010010A)
THIS COMPILATION WAS DONE ON 03 NOV 76 AT 16:36:43

03 NOV 76

101

SUBROUTINE FDISY ENTRY POINT 000077

STORAGE USED: CODE(1) 000103; DATA(0) 000136; BLANK COMMON(2) 000000

COMMON BLOCKS:

0003 DISPL 001463

EXTERNAL REFERENCES (BLOCK, NAME)

0004 FISHIN
0005 NMDU6
0006 NIOZ5
0007 NERR35

STORAGE ASSIGNMENT (BLOCK, TYPE, RELATIVE LOCATION, NAME)

0000	000101	11F	0001	000005	11SG	0001	000013	11SG	0001	000054	15L	0001	000064	20L		
0003	001342	ACROP	0003	001351	ANALYS	0003	001343	AOYHER	0003	001344	ATOTAL	0003	000570	BMCOMB		
0003	000571	BMFEAT	0003	000567	BMFL3	0003	001354	CAM	0003	000000	CATFLG	0003	000001	CATNAM		
0003	000572	CDATE	0003	000076	CLSNAM	0003	000460	CLSSUB	0003	001075	CON	0003	001341	CROP		
0003	001366	CRPKEY	0001	001336	DESKEY	0003	001340	DESOTH	0003	001337	DESUNI	0003	000564	EMPTAS		
0000	R	000000	F	0003	001175	FETVC2	0003	000575	FIELD2	0003	000600	FIELD3	0003	001334	FILTER	
0004	R	000000	FISHIN	0000	R	000100	FX	0003	001171	FLOKEY	0003	000574	FLOSV2	0003	000577	FLOSV3
0000	R	000075	FX	0003	001001	HIGH	0000	I	000074	I	0000	000126	INJPS	0003	001237	KATNO
0003	I	001367	KEPPTS	0003	001335	MAPFMT	0003	001333	NOCAT	0003	001236	NOCL52	0003	I	001174	NOFET2
0003	001172	NOFLD2	0003	001173	NOFLD3	0003	000554	NOMAP	0003	I	001233	NOSUB2	0003	000556	NOSUB3	
0003	001234	NOTRFD	0000	I	000076	NS	0003	000557	PCFOKY	0003	000602	PCT103	0003	000566	PLTKEY	
0003	001345	SITE	0003	000563	STATKY	0003	000364	SUBCAT	0003	000173	SUBNAM	0003	000270	SUBNO		
0003	000677	SYMTEX	0003	R	000603	THRES	0003	000562	THRSKY	0003	000565	THRSVA	0003	001235	TOTVT2	
0003	000555	TOTVT3	0003	000561	TRNKEY	0003	000560	TSTKEY	0000	R	000077	VAN	0003	000576	VERTX2	
0003	000601	VERTX3														

00101	1*	SUBROUTINE FDISY
00101	2*	C-
00101	3*	C- ROUTINE TO USE FISH TO GET THRESHOLD VALUES
00101	4*	C-
00103	5*	DIMENSION F(60)
00103	6*	C-
00104	7*	INCLUDE CMBK10,LIST
00104	8*	C-
00104	9*	C- NOSUB2 = NUMBER OF SJACLSSES
00104	10*	C- THRES(1) CONTAINS INPUT CONFIDENCE LEVELS
00104	11*	C-
00104	12*	C-
00105	12*	COMMON/DISPL/CATFLG,CATNAM(61),CLSNAM(61),SUBNAM(61),SUBNO(60),
00105	12*	• SURCAT(63),CLSSUB(60),NOMAP,TOTVT3,NOSUB3,
00105	12*	• PCFOKY,TSTKEY,TRNKEY,THRSKY,STATKY,EMPTAS,THRSVA,
00105	12*	• PLTKEY,BMFLG,BMCOMB,BMFEAT,CDATE(2),
00105	12*	• FLOSV2,FIELD2,VERTX2,FLOSV3,FIELD3,VERTX3,PCT103,
00105	12*	• THRES(63),SYMTEX(66),HIGH(60),CON(60)

ORIGINAL PAGE IS
OF BETTER QUALITY

32

```

00105 12.      *      ,FLOKEY,NOFLO2,NOFLO3,NOFET2,FETVC2(30)
00105 12.      *      ,NOSUB2,NOTAFD,TOTVT2,NOCLS2
00105 12.      *      ,KATNO(60),NOCAT,FILTER,MAPFAT
00105 12.      *      ,DESKEY,DESUNI,DESOTH,CROP ,ACROP,AOTHEA,ATOTAL
00105 12.      *      ,SITE(4),ANALYS(3),CAM(10),CAPKEY,KEPPTS(60)
00106 12.      END
00107 13.      DO 10 I=1,NOSUB2
00112 14.      10 F(I)=1-THRES(I)
00112 15.      C-
00112 16.      C-      NX = NUMBER OF SAMPLES
00112 17.      C-      NOFET2 = NUMBER OF CHANNELS
00112 18.      C-
00112 19.      C-      COMPUTE THRESHOLD VALUES USING FISHER F-DISTRIBUTION FUNCTION
00112 20.      C-
00114 21.      DO 20 I=1,NOSUB2
00117 22.      FX = KEPPTS(I)
00120 23.      NS=KEPPTS(I)-NOFET2
00120 24.      C-
00120 25.      C-
00120 26.      C-
00121 27.      VAR=FISHIN(F(I),NOFET2,NS,.515)
00121 28.      C-
00122 29.      FX =(NOFET2*(FX-1)*(FX+1))/(NS*FX)
00122 30.      C-
00123 31.      THRES(I) = FX*VAR
00123 32.      C-
00124 33.      GO TO 20
00124 34.      C-
00124 35.      C-
00124 36.      C-
00124 37.      C-      THRESHOLD WILL BE SET TO 999.999 IF OVERFLOW OCCURS IN FISHIN.
00124 38.      C-
00125 39.      15 THRES(I)=999.999
00126 40.      WRITE(6,11)
00131 41.      11 FORMAT(6X,'FOIST= OVERFLOW CONDITION IN FISHIN ROUTINE, FOR SUBGLAS
00131 42.      15=',14,'. THRESHOLD SET TO 999.999')
00131 43.      C-
00131 44.      C-
00132 45.      20 CONTINUE
00132 46.      C-
00134 47.      RETURN
00135 48.      END

```

•NEW
••-1

END OF COMPILATION: NO DIAGNOSTICS.



MAP, LARSAA, LARSAA

03 NOV 76

16:37

-12,12

E SEG DISPLAY-DISPL-=(DISPLV1,DISPLV2,SETUP3,EMTHRS,PRTPCT,FOIST)

1. BLK BMTX,SCRACH
2. BLK PASS,CLASS,DISPL,FSL,DVNBK,GRCBLK,STBASE,STCBLK,TABLCK
3. SEG MONTOR-A=(B,C,D,E,F,G,H,I)
4. A SEG =(TAPERD,CROSTA,A1,GNPSCN,MTFLD)
5. A1 SEG REOSAV-SAVFIL-CLSCMA-REDDAT
6. B SEG HIST-GRAYMP-GRCBLK-=(SETUP5,SETUP6,HISTGM,PICT)
7. C SEG STAT-STBASE-STCBLK-=(SETUP1,C1)
8. C1 SEG LEARNH-=(CLSSPC,COVAR)
9. D SEG CLSFY1-BMTX-SCRACH-CLASS-=(DA,D1,SETUP2)
10. DA SEG CLSFY1-MCHLSK-THRESH-FALSY-GGG-GJR-RELEA
11. D1 SEG CLSFY2-CONEX-CATRY
12. E SEG DISPLAY-DISPL-=(DISPLV1,DISPLV2,SETUP3,EMTHRS,PRTPCT,FOIST) -NEW
13. F SEG SELECT-DIVERG-TRACE-COLINV-F1-FSL-DVNBK-=(F2,PRELIM,) --1
14. EXSRCH,WHRLC,F4,USFRIN,GENAPT,EVLFT,PLOT)
15. F1 SEG GYSTAT-EVALSP-=(AVEDIV,TANDIV,BHTCH,TANCLS)
16. F2 SEG SETUP4-=(WGTSCN,WGTCH,PRTFD)
17. I SEG DATATA-TASTAT-TABLCK-TRANSF-FLOATR-=(MAMAT,TANIST,LNTRAN,
18. SETUP8,KBTAN,SETUP9,TRANX)
19. F4 SEG DAVIDN-=(DAVON1,DAVON2,DAVON3)
20. G SEG ISOCLS-PRINT-RONEAN-PASS-=(SETUP7,ISODAT,COVAR1,
21. TWITE,PCNST1,CHAIN,RODATA,OSTAPE)
22. H SEG SIGERT

MAP LCC 1104 0036

LARSAA SYMBOLIC
LARSAA CODE PROCESSED MAP

16 AUG 76	14:13:47	0	01457666	14	22 (DELETED)
16 AUG 76	14:13:47	1	01460352	1896	1 (DELETED)
		62	01464122	12	1



* FOR,= REOIF3,REOIF3
UNIVAC 1100 FORTRAN V EXEC 11 LEVEL 25A -(EXEC0 LEVEL E12010010A)
THIS COMPILATION WAS DONE ON 03 NOV 76 AT 16:36:45

03 NOV 76

16.7

-153,153

C- -- SET THRESHOLD KEYS FOR EMPIRICAL THRESHOLDING,TURN OTHERS OFF

395 THRSVA=0

EMPTAS=2

-159,159

C- -- SET THRESHOLD KEYS FOR CHI SQUARE THRESHOLDING,TURN OTHERS OFF

397 EMPTAS=0

THRSVA=0

THRSKV=1

-164,164

C- -- SET THRESHOLD KEYS FOR INPUT-VALUE THRESHOLDING,TURN OTHERS OFF

398 EMPTAS=0

THRSVA=3

-167,167

C- CHECK FOR FISHER ON FILTER

399 COL=COL+1

M=NXTCHR(CARD2,COL)

IF(M.EQ.'L') GO TO 3990

IF(M.EQ.'S') GO TO 3991

GO TO 315

3990 FILTER=1

GO TO 390

C-

3991 IX=0

DO 3995 I=1,NDSUB2

IF(KEPPTS(I).GT.NOFET2)GO TO 3995

IF(IX.NE.0)GO TO 3993

WRITE(6,3992)

3992 FORMAT(1H0,////)

ORIGINAL FILED IN
OF POOR QUALITY

20

35



1651

3993 WRITE(6,3994)1,KEPPYS,NOFET2

3994 FORMAT(1, '***** FISHER THRESHOLD REQUESTED-NOT PERFORMED',/,0X,
1'... NO. SAMPLES FOR SUBCLASS',16,'(1',16,') IS LESS THAN OR EQUAL
2 TO NUMBER OF CHANNELS (1', 16,')',/)

3995 CONTINUE

IF(IX.EQ.0)GO TO 3996

WRITE(6,3992)

GO TO 390

C-

C- -- SET THRESHOLD KEYS FOR FISHER THRESHOLDING.TURN OTHERS OFF

3996 EMPTAS=0

THRSVA=0

THRSKY=4

C-

C-

-269.269

C-

C- BYPASS IF NOT EQUAL TO 1 OR 2.

C-

IF(THRSKY.GT.2) GO TO 830

C-

SUBROUTINE REDIF3 ENTRY POINT 001437

STORAGE USED: CODE(1) 001452; DATA(0) 000545; BLANK COMMON(2) 000000

COMMON BLOCKS:

0003 DISPL 001463

0004 GLOBAL 000075

EXTERNAL REFERENCES (BLOCK, NAME)

0005 CHIN

0006 MATCHR

0007 FIND

0010 FLTNM

0011 LAREAD

~~3/4~~

3/4


```

0012 CHERA
0013 MROU6
0014 M1016
0015 M1026
0016 MUDU6
0017 MERR26
0020 MERR36

```

STORAGE ASSIGNMENT (BLOCK, TYPE, RELATIVE LOCATION, NAME)

0001	000047	10L	0001	000134	100L	0000	000116	104F	0001	000166	110L	0001	001376	1400L
0000	000331	14000F	0001	001403	1500L	0000	000344	15002F	0001	000041	176G	0001	000203	200L
0000	000123	201F	0001	000056	211G	0001	000071	221G	0001	000100	230G	0001	000211	260G
0001	000225	270G	0001	000262	300G	0001	000216	300L	0000	000120	304F	0001	000253	315L
0000	000125	3152F	0001	000267	340L	0001	000403	354G	0001	000272	360L	0001	000431	371G
0001	000275	380L	0001	000317	385L	0001	000320	390L	0001	000332	395L	0001	000340	397L
0001	000345	398L	0001	000353	399L	0001	000373	3990L	0001	000376	3991L	0000	000163	3992F
0001	000422	3993L	0000	000165	3994F	0001	000437	3995L	0001	000451	3996L	0001	000456	400L
0001	000503	420G	0001	000516	430G	0001	000531	440G	0001	000544	447G	0001	000557	456G
0001	001010	554G	0001	000475	600L	0000	000222	601F	0001	001162	633G	0001	001227	657G
0001	000510	710L	0001	000523	720L	0001	000536	730L	0001	001412	734G	0001	000551	740L
0001	000564	750L	0001	000614	760L	0001	000623	770L	0000	000226	772F	0001	000656	773L
0001	000710	780L	0001	000724	781L	0001	000760	800L	0001	001036	825L	0001	001025	826L
0000	000236	827F	0001	001040	830L	0001	001045	840L	0001	001142	850L	0000	000267	851F
0000	000271	853F	0001	001201	854L	0001	001207	860L	0000	000311	862F	0001	001246	863L
0001	001252	865L	0001	001315	870L	0002	000224	888F	0003	R 001342	ACRDP	0003	001351	ANALYS
0003	M 001343	ADTHER	0004	000073	ASAV	0004	000074	ASAVFL	0003	M 001344	ATOTAL	0000	000051	BLANK
0003	I 000570	BACONB	0003	000571	BMFEAT	0004	000355	BMFILE	0003	I 000567	BMFLG	0004	000056	BMKEY
0000	I 000060	C	0003	001354	CAN	0000	I 000101	CANS	0000	000360	CAROI	0000	I 000372	CARD2
0003	000000	CATFLG	0003	000001	CATNAM	0003	000572	CDATE	0005	M 000000	CMIN	0000	I 000112	CLSIND
0003	I 000076	CLSNAM	0003	I 000460	CLSSUB	0000	I 000031	COMACT	0000	I 000075	CODE	0000	I 000076	COL
0004	I 000037	COMMENT	0000	I 000052	COMMA	0003	I 000020	COMVEC	0003	001075	CON	0003	I 001341	CROP
0003	I 001366	CRPKEY	0004	000053	DATAPF	0004	I 000010	DATE	0004	000071	DATFIL	0003	I 001336	DESKEY
0003	001340	DESDTH	0000	I 000057	DESSYM	0003	001337	DESUNI	0004	000067	DRMWD5	0004	000066	DRUMAD
0000	I 000055	DUPSYM	0003	I 000564	EMPTRS	0000	I 000047	ENDACO	0000	I 000043	EQJCOM	0004	000062	ERIPTP
0004	000063	ERPKEY	0003	001175	FETVCE	0003	000575	FIELD2	0003	000600	FIELD3	0003	I 001334	FILTER
0007	I 000000	FIND	0003	001171	FLDKEY	0003	000574	FLDSV2	0003	000577	FLDSV3	0010	I 000000	FLTNUM
0000	I 000064	GNPTR	0004	000000	HEAD	0004	I 000022	HEAD	0004	I 000023	HEAD	0003	R 001001	HIGH
0004	000057	HISFIL	0004	000060	HISKEY	0000	I 000073	I	0000	I 000103	ISIT	0000	I 000104	IC
0000	I 000110	ICH	0000	I 000022	INF	0000	000516	INJPS	0000	I 000001	INTAPE	0000	I 000107	IPT
0000	I 000100	IX	0000	I 000102	J	0003	001237	KATNO	0003	I 001367	KEPPTS	0000	I 000061	L
0011	I 000000	LAREAD	0000	I 000071	LOGSWT	0000	I 000077	M	0003	I 001335	MAPFAT	0004	000052	MAPTAP
0004	000064	MAPUNT	0000	I 000106	MZ	0000	I 000114	NAME	0000	I 000105	NDEGA	0003	001333	NOCAT
0003	I 001236	NOCL52	0003	I 001174	NOFET2	0004	000065	NOFILE	0003	001172	NOFLO2	0003	I 001173	NOFLO3
0000	I 000065	NOJRP	0003	I 000554	NONAP	0003	I 001233	NO SUB2	0003	I 000556	NO SUB3	0003	I 001234	NOTRFO
0000	I 000111	NV	0006	I 000000	NITCHA	0003	I 000022	OPT	0000	I 000046	OPTNUM	0004	000070	PAGS12
0000	I 000072	PCCLKY	0003	I 000557	PCFDRY	0003	000672	PCFID3	0003	I 000566	PLTKEY	0004	000054	SAVTAP
0003	I 001345	SITE	0004	000072	STAFIL	0003	I 000563	STATKY	0000	I 000063	STOPFG	0003	000364	SUBCAT
0000	I 000113	SUBIND	0003	I 000173	SUBNAM	0003	000270	SUBND	0000	I 000062	SYNCNT	0000	I 000074	SYMMAX
0003	I 000677	SYMMTH	0000	I 000115	TEST	0003	R 000563	THRES	0003	I 000562	THRSKY	0003	I 000565	THRSVA
0000	I 000056	THRSYM	0000	I 000050	THSHCO	0003	I 000267	THSCNT	0003	001235	TOTV2	0003	I 000555	TOTV3
0004	000061	THSDRM	0003	I 000561	TANKEY	0000	I 000563	TRANSYM	0000	I 000070	TSTCNT	0003	I 000560	TSTKEY
0000	I 000054	TSTSYM	0000	I 000066	TYPE	0003	000576	VERTX2	0003	000601	VERTX3	0000	R 000000	X

00100	1*	C	//REQIF3	REQ30000
00101	2*		COMPILER (DATA=SHORT)	REQ30010
00103	3*		SUBROUTINE REQIF3(TSTSAV, TSTFLO, TSTVER, VDIM)	
00105	4*		IMPLICIT INTEGER (A-H, O-Z)	REQ30050
00105	5*	CI	-----	REQ30060

```

00105 60 CI ----- RED30070
00105 70 CI ----- RED30240
00105 80 CI PURPOSE.. READS AND ANALYZES SUPERVISOR CONTROL CARDS RED30250
00105 90 CI FOR ' DISPLAY' RED30260
00105 100 CI ----- RED30270
00105 110 CI ----- RED30290
00105 120 CI ----- RED30300
00105 130 CI ----- RED30310
00105 140 C RED30320
00105 150 C RED30330
00105 160 C RED30340
00105 170 C RED30350
00106 180 EQUIVALENCE (MED1(1),HEAD(3)), (DATE(1),HEAD(15)), RED30580
00106 190 1 (MED2(1),HEAD(20)), (COMMENT(1),HEAD(32)) RED30590
00106 200 C RED30600
00106 210 C ----- RED30610
00107 220 INCLUDE CMH410,LIST
00110 220 COMMON/DISPL/CATFLG,CATNAM(61),CLSNAM(61),SUBNAM(61),SUBND(60),
00110 220 * SUBCAT(60),CLSSUB(60),NOMAP,TOTVT3,NOSUB3,
00110 220 * PCF04Y,TSTKEY,TANKEY,THRSKY,STATKY,EMPTAS,THRSVA,
00110 220 * PLTKEY,BMFLG,BMCOM8,BMFEAT,CDATE(2),
00110 220 * FLOS2,FIELD2,VERT2,FLOS3,FIELD3,VERT3,PCT103,
00110 220 * THRS(60),SYMTX(166),HIGH(60),CON(60)
00110 220 * ,FLOKEY,NOFLO2,NOFLO3,NOFET2,FETV2(30)
00110 220 * ,NOSUB2,NOTAFD,TOTVT2,NOCLS2
00110 220 * ,KATND(60),NOCAT,FILTER,MAPFMT
00110 220 * ,DESKEY,DESUNI,DESOIH,CROP ,ACROP,AOTHER,ATOTAL
00110 220 * ,SITE(4),ANALYS(3),CAM(10),CRPKEY,KEPPTS(60)
00111 220 END *NEW
00112 230 REAL HIGH,CMIN ---1
00113 240 REAL ACROP,AOTHER,ATOTAL,X
00113 250 C RED30720
00114 250 REAL THRES
00115 270 DATA INTAPE/5/
00117 280 DIMENSION TSTS(4,200),TSTFLO(5,200),TSTVFR(VDIM),
00117 290 * OPT(14),CONVEC(2),INF(7)
00117 300 3,CODBCD(10),EQUCOM(3),CARD2(62),CARD1(80)
00117 310 4 , COMMENT(10), DATE(2), MED1(10), MED2(10) RED30770
00117 320 C RED30780
00120 330 DATA OPT/'SYMBOL','SITE','OPTION','THRESH','ANALYS','COMMENT',
00120 340 * 'MED1','MED2','DATE','PRGCD','ACREAS','END',
00120 350 * 'FORMAT','CROP'
00122 360 DATA OPTNUM/12/,ENOBOD/'END',THSACD/THRS/,ALANK/'',
00122 370 1 COMMA/'',CODBCD/'',S,'O','P','M','E','C','T','F'
00122 380 2 , EQUCOM/2,/,/,/,CONVEC/1,/,/ RED30830
00122 390 C RED30840
00133 400 DATA SYMTX/'1','2','3','4','5','6','7','8','9','A','B','C','D',
00133 410 1 'E','F','G','H','I','J','K','L','M','N','O','P','Q',
00133 420 2 'R','S','T','U','V','W','X','Y','Z','A','B','C','D',
00133 430 3 'E','F','G','H','I','J','K','L','M','N','O','P','Q',
00133 440 4 'R','S','T','U','V','W','X','Y','Z'
00135 450 DATA TRNSYM,TSTSYM,DUPSYM,THRSYM/,,/,/,/,/
00142 460 DATA DESSYM/''/
00144 470 DATA C,L/'C','L'
00147 480 INCLUDE CMH46,LIST
00150 480 COMMON/GLOBAL/HEAD(42),MAPTAP,DATAP,SAVTAP,MFILE,BMKEY,
00150 480 * HISFIL,HISKEY,TRFORM,ERIPTP,ERAPF,MAPUNT,NOFILE,
00150 480 * DRUMAD,DRMJDOS,PAGSIZ,DATFIL,STAFIL,ASAV,ASAVFL
00151 480 END
00152 490 EQUIVALENCE (CARD2(1),CARD1(1)) RED30860
00152 500 C RED30870
00152 510 C ----- RED30880
00152 520 C ----- RED30890

```



00152	53.	C		RED30900
00152	54.	C	INIZ	RED30910
00152	55.	C		RED30920
00152	56.	C		RED30930
00153	57.		MAPFAT = 0	
00154	58.		NOMAP=1	
00155	59.		FILTER=0	
00156	60.		THRSVA = 0	
00157	61.		EMPTAS = 0	
00160	62.		SYMCNT = 0	RED30940
00161	63.		THRSKY=0	
00162	64.		STOPFG = 0	RED30950
00163	65.		GRPTA = 0	RED30960
00164	66.		MAPHP = 0	RED30970
00165	67.		NOTAFD = 0	RED30980
00166	68.		TYPE=0	
00167	69.		CAPKEY=0	
00170	70.		THSCNT=0	RED30990
00171	71.		DESKEY=0	
00172	72.		TSTCNT = 0	RED31000
00173	73.		LOGSWT = 0	RED31010
00174	74.		PCCLKY = 1	RED31050
00175	75.		DO 6 I=1,SYMMAX	RED31060
00200	76.		THRES(I) = 0	RED31080
00201	77.		6 CONTINUE	
00203	78.		NOFLO3=200	
00204	79.		SYMMAX=60	
00205	80.		10 CONTINUE	
00205	81.	C		RED31190
00205	82.	C		RED31200
00205	83.	C	READ IN SUPERVISOR CARDS	RED31210
00205	84.	C		RED31220
00205	85.	C		RED31230
00206	86.		15 READ(INTAPE,104) CODE,CARD2	RED31260
00215	87.		104 FORMAT (A6,4X,62A1)	RED31270
00216	88.		17 WRITE(6,304) CODE,CARD2	RED31280
00225	89.		304 FORMAT (T7,A6,4X,62A1)	RED31290
00226	90.		19 COL = 0	RED31300
00227	91.		DO 20 I=1,14	
00232	92.		20 IF(OPT(I) .EQ. CODE)GO TO(100,200,300,400,600,710,720,730,	
00232	93.		740,760,770,800,750,780),I	
00235	94.		GOTO 1500	RED31340
00235	95.	C		RED31350
00235	96.	C	GET SYMBOLS	RED31360
00235	97.	C		RED31370
00235	98.	C		RED31380
00236	99.		100 IF (SYMCNT .GE. SYMMAX) GOTO 10	RED31390
00240	100.		SYMCNT = SYMCNT+1	RED31400
00241	101.		SYMTX(SYMCNT) = BLANK	RED31410
00242	102.		M = NITCHR(CARD2,COL)	RED31420
00243	103.		IF (M .EQ. BLANK) GO TO 10	RED31430
00245	104.		IF (M .EQ. COMMA) GO TO 100	RED31440
00247	105.		SYMTX(SYMCNT) = CARD2(COL)	RED31450
00250	106.		110 M = NITCHR(CARD2,COL)	RED31460
00251	107.		IF (M .EQ. BLANK) GO TO 10	RED31470
00253	108.		IF (M .NE. COMMA) GO TO 110	RED31480
00255	109.		GO TO 100	RED31490
00255	110.	C*		
00255	111.	C*	SITE NAME	
00255	112.	C*		
00256	113.		200 READ(30,201)SITE	
00264	114.		201 FORMAT(1X,4A6)	
00265	115.		GO TO 10	

ORIGINAL OF FOOT

00265	117	C		RED31890
00265	117	C	SCAN OPTION CARD	RED31900
00265	119	C	-----	RED31910
00265	119	C		RED31920
00265	119	C		RED31930
00266	120		300 M = NETCHR(CARD2,COL)	
00267	121		DO 310 I=1,9	
00272	122		310 IF (M.EQ. COORDC(I)) GO TO (10,340,360,380,395,395,	
00272	123		397,398,399),I	
00275	124		315 WRITE(6,3152) CODE, CARD2	
00304	125		3152 FORMAT(//// 5X,'**** DISPLAY/REDIF3 --- ERROR IN 'OPTION' CA	
00304	126		IRD ...//5X,2H',A6,4X,62A1,2H'//5X,'**** SCAN OF THIS CARD DIS	
00304	127		2CONTINUED --- PROCEEDING TO NEXT CARD **** //)	
00305	128		GO TO 10	RED31980
00305	129	C	-----	RED32050
00305	130	C		RED32060
00306	131		340 STATV = 1	RED32070
00307	132		GO TO 390	RED32080
00307	133	C	-----	RED32090
00307	134	C		RED32100
00310	135		360 TANKEY = 1	RED32110
00311	136		GO TO 390	RED32120
00311	137	C	-----	RED32130
00311	138	C		RED32140
00311	139	C		RED32150
00312	140		380 M=NETCHR(CARD2,COL)	
00313	141		IF(M.EQ.C)PCFOKY=1	
00315	142		IF(M.EQ.L)PLTRY=1	
00317	143		GO TO 390	
00317	144	C	-----	
00317	145	C		
00320	146		385 HOMAP=0	RED32170
00320	147	C	-----	RED32180
00320	148	C		RED32190
00321	149		390 M = FIND(CARD2,COL,EQUONM)	RED32200
00322	150		IF (M .LE. 0) GO TO 10	RED32210
00324	151		GO TO 300	
00324	152	C		
00324	153	C-	-- SET THRESHOLD KEYS FOR EMPIRICAL THRESHOLDING,TURN OTHERS OFF	*NEW
00325	154		395 THRSVA=0	*NEW
00326	155		EMPTAS=2	*NEW
00327	156		THRSKY=2	***1
00330	157		GO TO 390	
00330	158	C		
00330	159	C	-----	
00330	160	C		
00330	161	C-	-- SET THRESHOLD KEYS FOR CHI SQUARE THRESHOLDING,TURN OTHERS OFF	*NEW
00331	162		397 EMPTAS=0	*NEW
00332	163		THRSVA=0	*NEW
00333	164		THRSKY=1	*NEW
00334	165		GO TO 390	***1
00334	166	C		
00334	167	C	-----	
00334	168	C		
00334	169	C-	-- SET THRESHOLD KEYS FOR INPUT-VALUE THRESHOLDING,TURN OTHERS OFF	*NEW
00335	170		398 EMPTAS=0	*NEW
00336	171		THRSVA=3	*NEW
00337	172		THRSKY=3	***1
00340	173		GO TO 390	
00340	174	C-	CHECK FOR FISHER OR FILTER	*NEW
00341	175		399 COL=COL+1	*NEW
00342	176		M=NETCHR(CARD2,COL)	*NEW
00343	177		IF(M.EQ.'L') GO TO 3990	*NEW
00345	178		IF(M.EQ.'S') GO TO 3991	*NEW


```

00453 2420 C -----
00453 2430 C
00454 2440 740 READ (30,9998) DATE
00462 2450 GO TO 10
00462 2460 C
00462 2470 C MAP TAPE FORMAT
00462 2480 C -----
00463 2490 750 M = NATCHR(CARD2,COL)
00464 2500 IF (M.EQ.1NU) MAPFMT = 1
00466 2510 IF (M.EQ.1HL) MAPFMT = 2
00470 2520 IF (M.EQ.1W) MAPFMT = 1
00472 2530 GO TO 10
00472 2540 C
00472 2550 C
00472 2560 C
00472 2570 C* PROCEDURE CONFIGURATION TITLE
00472 2580 C*
00473 2590 760 READ(30,9998)CAMS
00476 2600 GO TO 10
00476 2610 C*
00476 2620 C* ACREAGE
00476 2630 C*
00477 2640 770 M=NATCHR(CARD2,COL)
00500 2650 IF(M.EQ.BLANK)GO TO 10
00502 2660 IF(M.EQ.COMMA)GO TO 770
00504 2670 J=FINDCARD2,COL,EQUCOM)
00505 2680 IF(J.EQ.2)GO TO 773
00507 2690 WRITE(6,772)
00511 2700 772 FORMAT(' *ERROR IN ACREAGE CARD - CARD (IGNORED)')
00512 2710 GO TO 10
00513 2720 773 J = FLTNUM(CARD2,COL,X,1)
00514 2730 IF(M.EQ.'Y')AFTOTAL=X
00516 2740 IF(M.EQ.'C')ACROP=X
00520 2750 IF(M.EQ.'D')AOTHER=X
00522 2760 GO TO 770
00522 2770 C*
00522 2780 C* INTENSIVE STUDY CROP NAME
00522 2790 C*
00523 2800 780 M=NATCHR(CARD2,COL)
00524 2810 IBIT=0
00525 2820 IC=1
00526 2830 CROP=BLANK
00527 2840 CAPK =1
00530 2850 781 FLD(IBIT,6,CROP)=FLD(0,6,M)
00531 2860 IBIT=IBIT+6
00532 2870 IC=IC+1
00533 2880 IF(IC.GT.6)GO TO 10
00535 2890 M=NATCHR(CARD2,COL)
00536 2900 IF(M.EQ.BLANK)GO TO 10
00540 2910 GO TO 781
00541 2920 800 CONTINUE
00541 2930 C*
00541 2940 C* *END* END OF CONTROL CARDS. - NOW FIND CHI-SQUARE THRESHOLDS,
00541 2950 C* THEN READ IN TEST FIELDS
00542 2960 IF (THSCNT.EQ.0) GO TO 830
00542 2970 C* IF THRESHOLDS WERE INPUT WITHOUT OPTION - ASSUME CHI-SQUARE
00544 2980 IF(THRSKY.EQ.0)THRSKY=1
00546 2990 NDEGR = NOFFT2
00547 3000 IF (AMFLG.GT. 0) NDEGR = AMCOMB
00547 3010 C-
00547 3020 C- BYPASS IF NOT EQUAL TO 1 OR 2.
00547 3030 C-
00551 3040 IF(THRSKY.GT.2) GO TO 830

```

RE032640
 RE032650
 RE032660
 RE032670

*NEW
 *NEW
 *NEW
 *NEW

```

00551 305* C-
00553 306*      DO 025 MZ=1,NOSUB2
00556 307*      HIGH(MZ) = 1, - THRES(MZ)
00557 308*      THRES(MZ) = CMIN(HIGH(MZ),NOEGR,0026)
00560 309*      GO TO 025
00561 310*      026 WRITE(6,027) MZ,THRES(MZ)
00565 311*      027 FORMAT(// ' *** A THRESHOLD VALUE IS OUTSIDE THE ALLOWABLE RANGE 0
00565 312*      ' - 1, THEREFORE ' ' NO THRESHOLDING HAS BEEN DONE IN THIS RUN
00565 313*      3***',15,F15.5//)
00566 314*      THRSK = 0
00567 315*      GO TO 030
00570 316*      025 CONTINUE
00572 317*      030 CONTINUE
00572 318* C+
00572 319* C+ NOW READ TEST ON DESIGNATED FIELDS
00572 320* C+
00573 321*      TOTVT3=0
00574 322*      NOFLD3=1
00575 323*      IPT=1
00576 324*      040 ICK=LAREAD(TSTSAV(1,NOFLD3),TSTVER(IPT),INF,NV)
00577 325*      IF(ICK.EQ.-1)GO TO 045
00601 326*      IF(ICK.EQ.-2)GO TO 050
00603 327*      IF(ICK.EQ.-1)GO TO 060
00605 328*      IF(ICK.EQ. 0)GO TO 070
00607 329*      TSTSAV(2,NOFLD3)=CLSIND
00610 330*      TSTSAV(3,NOFLD3)=SUBIND
00611 331*      TSTSAV(4,NOFLD3)=NV
00612 332*      TSTFLD(1,NOFLD3)=INF(1)
00613 333*      TSTFLD(2,NOFLD3)=INF(2)
00614 334*      TSTFLD(3,NOFLD3)=INF(4)
00615 335*      TSTFLD(4,NOFLD3)=INF(5)
00616 336*      TSTFLD(5,NOFLD3)=IPT
00617 337*      IPT=IPT + 2*NV
00620 338*      NOFLD3 = NOFLD3 + 1
00621 339*      TOTVT3=TOTVT3+NV
00622 340*      GO TO 040
00622 341* C+
00622 342* C+ SUBCLASS NAME
00622 343* C+
00623 344*      050 READ(30,051)NAME
00626 345*      IF(TYPE.EQ.2)GO TO 1400
00630 346*      TYPE=1
00631 347*      051 FORMAT(10X,A6)
00632 348*      DO 052 I=1,NOSUB2
00635 349*      052 IF(NAME.EQ.SUBNAM(I))GO TO 054
00640 350*      WRITE(6,053)NAME
00643 351*      053 FORMAT(' *ERROR ON SUBCLASS NAME CARD -',A6,' DOES NOT MATCH A SUB
00643 352*      *CLASS FROM THE MAPTAP FILE *')
00644 353*      CALL CERRR
00645 354*      054 SUBIND=I
00646 355*      CLSIND=CLSSUB(I)
00647 356*      GO TO 040
00647 357* C+
00647 358* C+ CLASSNAME CARD
00647 359* C+
00650 360*      060 READ(30,061)NAME
00653 361*      IF(TYPE.EQ.2)GO TO 1400
00655 362*      TYPE=1
00656 363*      DO 061 I=1,NOCLS2
00661 364*      061 IF(NAME.EQ.CLSNAM(I))GO TO 063
00664 365*      WRITE(6,062)NAME
00667 366*      062 FORMAT(' *ERROR ON CLASSNAME CARD -',A6,' DOES NOT MATCH A CLASS N
00667 367*      *AME FROM THE MAPTAP FILE *')

```

*NEW
**=1



LYNDON B. JOHNSON SPALP CENTER
HOUSTON, TEXAS

03 NOV 76

SIMULATED DATA - SS1052

DEITY

~~SECRET~~

464



```
00670 368*      CALL CMERR
00671 369*      863 CLSIND=1
00672 370*      SUBIND=0
00673 371*      GO TO 840
00673 372*      C*
00673 373*      C* DESIGNATED FIELDS
00673 374*      C*
00674 375*      865 READ(30,851)TEST
00677 376*      IF(TYPE.EQ.1)GO TO 1400
00701 377*      TYPE=2
00702 378*      SUBIND=1
00703 379*      IF(TEST.EQ.'OTHER')SUBIND=2
00705 380*      IF(TEST.EQ.'UNIDEN')CLSIND=NOSUB3+4
00707 381*      IF(TEST.EQ.'OTHER')CLSIND=NOSUB3+5
00711 382*      GO TO 840
00711 383*      C*
00711 384*      C* SEND* - END OF TEST OR DESIGNATED FIELDS
00711 385*      C*
00712 386*      870 NOFLD3 = NOFLD3-1
00713 387*      IF(TYPE.EQ.1 .AND. NOFLD3.GT.0)STKEY=1
00715 388*      IF(TYPE.EQ.2 .AND. NOFLD3.GT.0)DESKEY=1
00715 389*      C*
00715 390*      C* SET THRESHOLD AND OUTLINE SYMBOLS
00715 391*      C*
00717 392*      SYMTX(NOSUB3)=THRSYM
00720 393*      SYMTX(NOSUB3+1)=TANSYM
00721 394*      SYMTX(NOSUB3+2)=TSTSYM
00722 395*      SYMTX(NOSUB3+3)=DUPSYM
00723 396*      SYMTX(NOSUB3+4)=DESSYM
00724 397*      SYMTX(NOSUB3+5)=DESSYM
00724 398*      C
00724 399*      C GO HOME
00724 400*      C -----
00724 401*      C
00725 402*      RETURN
00725 403*      C
00725 404*      C ERROR ROUTINES
00725 405*      C -----
00725 406*      C
00726 407*      1400 WRITE(6,14000)
00730 408*      14000 FORMAT(' TEST FIELDS AND DESIGNATED FIELDS CANNOT BE INPUT TOGETHE
00730 409*      *R'//)
00731 410*      1500 WRITE (6,15002) CODE, CARD2
00740 411*      15002 FORMAT(/X,A6,X,62A)/' INVALID CONTROL CARD-CHECK SPELLING OF KEY
00740 412*      * WORD* )
00741 413*      GO TO 10
00742 414*      END
```

RED33210
RED33220
RED33230
RED33240
RED33250
RED33260
RED33270
RED33280
RED33290

RED33300

RED33330

END OF COMPILATION: NO DIAGNOSTICS.
REDIF3 SYMBOLIC
REDIF3 CODE RELOCATABLE

16 AUG 76	14:18:05	0	02323656	14	373	(DELE1
16 AUG 76	14:18:05	1	02336024	36	1	(DELE1
		0	02336070	14	102	

ORIGINAL FILED IN
ON PCOR 11/1/76

45



FOR, SETUP3, SETUP3
UNIVAC 1108 FORTRAN V EXEC 11 LEVEL 25A -(EXEC9 LEVEL E12010010A)
THIS COMPILATION WAS DONE ON 03 NOV 76 AT 16:37:00

03 NOV 76

10:

-80,80

*, (KATNO(1), I=1, NOCLS2), (KEPPTS(1), I=1, NOSUR2)

-100

C-

C- TEST FOR FISHER

IF (THRSKY.EQ.4) GO TO 80

C-

-109

C-

C- TEST FOR FISHER

IF (THRSKY.EQ.4) WRITE(6,817)

C-

-126

C-

817 FORMAT(10, 'APPLY FISHER F-DISTRIBUTION THRESHOLDS')

C-

SUBROUTINE SETUP3 ENTRY POINT 001227

STORAGE USED: CODE(1) 001464; DATA(0) 000553; BLANK COMMON(2) 000000

COMMON BLOCKS:

0003 GLOBAL 000075
0004 DISPL 001463

EXTERNAL REFERENCES (BLOCK, NAME)

0005 FIND
0006 NUMBER
0007 FS85FL
0010 EXIT
0011 REDIF3
0012 WATFLO
0013 NROUS
0014 N1015
0015 N1025
0016 NREWS
0017 NWDUS
0020 NRBUS

~~46~~

46



0021 NERR33

STORAGE ASSIGNMENT (BLOCK, TYPE, RELATIVE LOCATION, NAME)

0000	000174	1F	0001	000041	10L	0001	001025	102L	0001	001046	103L	0001	001070	105L
0001	001076	106L	0001	000011	122G	0001	000065	15L	0001	001433	20L	0001	001175	200L
0001	000157	202G	0001	000250	225G	0001	000255	231G	0001	000262	235G	0001	000267	241G
0001	000275	245G	0001	000303	251G	0001	000310	255G	0001	000315	261G	0001	000322	265G
0001	000327	271G	0000	000175	45F	0001	001001	450G	0001	000132	50L	0000	000431	5044F
0001	001200	506L	0001	001260	526G	0001	001310	541G	0001	000173	55L	0001	001422	566G
0001	000423	80L	0000	000233	802F	0000	000244	803F	0000	000252	804F	0000	000261	805F
0000	000267	806F	0000	000276	808F	0000	000304	810F	0000	000312	812F	0000	000325	817F
0000	000335	818F	0000	000345	819F	0000	000346	820F	0000	000356	821F	0000	000373	822F
0000	000401	823F	0000	000416	824F	0001	000720	85L	0001	000764	99L	0004	001342	ACROP
0004	001351	ANALYS	0004	001343	AOTHER	0003	000073	ASAV	0003	000074	ASAVFL	0004	001344	ATOTAL
0004	000570	BMCOMB	0004	000571	BMFEAT	0003	000055	BMFILE	0004	000567	BMFLG	0003	000056	BMKEY
0004	001354	CAN	0000	000040	CARD	0004	000000	CATFLG	0004	000001	CATNAM	0004	000572	CDATE
0004	000076	CLSNAM	0004	000460	CLSSUB	0000	000140	COL	0004	001075	CON	0004	001341	CROP
0004	001366	CRPKEY	0003	000053	DATAPE	0003	000071	DATFIL	0004	001336	DESKEY	0004	001340	DESOTM
0004	001337	DESUNI	0003	000067	DRUMDS	0003	000066	DRUMAD	0004	000564	EMPTAS	0003	000062	ERIPTP
0003	000063	ERPKEY	0004	001175	FETVC2	0004	000575	FIELD2	0004	000600	FIELD3	0004	001334	FILTER
0000	000036	FILVEC	0005	000000	FIND	0004	001171	FLOKEY	0004	000574	FLOSV2	0004	000577	FLOSV3
0003	000000	HEAD	0004	001001	HIGH	0003	000057	HISFIL	0003	000060	HISKEY	0000	000147	I
0000	000161	IAD	0000	000164	IB	0000	000162	IBO	0000	000172	IE	0000	000157	IK
0000	000472	INJPS	0000	000457	INJPS	0000	000464	INJPS	0000	000165	IPT	0000	000145	ISTAT
0000	000173	J	0004	001237	KATNO	0004	001367	KEPPTS	0000	000171	LINEND	0000	000170	LINSTR
0000	000142	M	0004	001335	MAPFMT	0003	000052	MAPTAP	0003	000064	MAPUNT	0000	000137	NBCD
0000	000150	NCAT	0000	000144	NF	0000	000141	NFILE	0004	001333	NOCAT	0004	001236	NOCLS7
0004	001174	NOFET2	0003	000065	NQFILE	0004	001172	NQFLD2	0004	001173	NQFLD3	0004	000554	NOMAP
0004	001233	NOSUB2	0004	000556	NOSUB3	0000	000156	NOTHRS	0004	001234	NOTAFD	0006	000000	NUMBER
0000	000000	NJRVEC	0000	000152	NV	0003	000070	PAGSIZ	0004	000557	PCFDKY	0004	000602	PCTID3
0000	000160	PCT52	0004	000566	PLYKEY	0000	000167	SANEND	0000	000166	SAMSTR	0003	000054	SAVTAP
0000	000143	SERIAL	0004	001345	SITE	0003	000072	STAFIL	0004	000563	STATKY	0000	000155	STOPFG
0004	000364	SUBCAT	0004	000173	SUBNAM	0004	000270	SUBND	0004	000677	SYMTX	0004	000603	THRES
0004	000562	THASKY	0004	000565	THRSVA	0000	000163	TIME	0000	000151	TOP1	0000	000154	TOP2
0004	001235	TOTVT2	0004	000555	TOTVT3	0003	000061	TRFORM	0004	000561	TANKEY	0004	000560	TSTKEY
0000	000146	VARSZ2	0000	000153	VDIM	0004	000576	VERTX2	0004	000601	VERTX3	0000	000136	VBOD

```
00101 1* SUBROUTINE SETUP3(ARRAY,TOP)
00103 2* INCLUDE COMAK6.LIST
00104 2* COMMON/GLOBAL/HEAD(42),MAPTAP,DATAPE,SAVTAP,BMFILE,BMKEY,
00104 2* HISFIL,HISKEY,TRFORM,ERIPTP,ERPKEY,MAPUNT,NQFILE,
00104 2* DRUMAD,DRUMDS,PAGSIZ,DATFIL,STAFIL,ASAV,ASAVFL
00105 2* END
00106 3* INCLUDE CMK10.LIST
00106 4* C
00107 4* COMMON/DISPL/CATFLG,CATNAM(61),CLSNAM(61),SUBNAM(61),SUBND(60),
00107 4* SUBCAT(60),CLSSUB(60),NOMAP,TOTVT3,NOSUB3,
00107 4* PCFDKY,TSTKEY,TRKEY,THASKY,STATKY,EMPTAS,THRSVA,
00107 4* PLYKEY,BMFLG,BMCOMB,BMFEAT,CDATE(2),
00107 4* FLOSV2,FIELD2,VERTX2,FLOSV3,FIELD3,VERTX3,PCTID3,
00107 4* THRES(60),SYMTX(66),HIGH(60),CON(60),
00107 4* FLOKEY,NQFLD2,NQFLD3,NQFET2,FETVC2(30),
00107 4* NOSUB2,NOTAFD,TOTVT2,NOCLS2
00107 4* KATNO(60),NOCAT,FILTER,MAPFMT
00107 4* DESKEY,DESUNI,DESOTM,CROP,ACROP,AOTHER,ATOTAL
00107 4* SITE(4),ANALYS(3),CAN(10),CRPKEY,KEPPTS(60)
00110 4* END
00111 5* IMPLICIT INTEGER (A-M,O-Z)
```

SET30030
NEW
--1
SET30040

47
ORIGINAL PAGE IS
OF POOR QUALITY



```
00111 60 C1-----[SET30050
00111 70 C1-----[SET30060
00111 80 C1-----[SET30220
00111 90 C1 PURPOSE.. LOCATES FILE ON 'MPTAP' AND COORDINATES [SET30230
00111 100 C1 ROUTINES TO ANALYZE 'DISPLAY' CONTROL CARDS [SET30240
00111 110 C1 [SET30250
00111 120 C1 [SET30300
00111 130 C1-----[SET30310
00111 140 C [SET30320
00111 150 C [SET30330
00112 160 DIMENSION NUMVEC(30),FILVEC(2)
00113 170 DIMENSION CARD(62),ARRAY(1)
00114 180 DATA YBCD/ 'Y' /, NDCD/ 'N' /, FILVEC/ 1 , 'F' /
00114 190 C [SET31000
00114 200 C-----[SET31010
00114 210 C [SET31020
00114 220 C [SET31070
00114 230 C* REEAD AND SCAN 'DISPLAY' CONTROL CARD FOR FILE NUMBER
00114 240 C-----[SET31090
00114 250 C [SET31100
00120 260 READ(30,1)CARD
00126 270 1 FORMAT(62A1)
00127 280 COL = 0 [SET31110
00130 290 NFILE = 0
00131 300 5 M = FIND(CARD,COL,FILVEC)
00132 310 IF ( M .LE. 0 .OR. COL .EQ. 62) GO TO 15
00134 320 M = 0
00135 330 10 M = NUMBER( CARD, COL, NUMVEC, M)
00136 340 IF( M .EQ. 0 .AND. COL .LT. 62) GO TO 10
00140 350 NFILE = NUMVEC(1)
00141 360 15 IF (NFILE .LE. 0) NFILE = 1
00142 370 SERIAL = NFILE
00143 380 C [SET31280
00143 390 C GET TAPE READY [SET31290
00143 400 C [SET31300
00144 410 40 REWIND MPTAP [SET31310
00145 420 IF ( NFILE .EQ. 1 ) GO TO 50 [SET31320
00147 430 NF = NFILE - 1 [SET31330
00150 440 CALL FSBSFL(MPTAP,NF,ISTAT)
00151 450 IF (ISTAT .EQ. 0) GO TO 50
00153 460 WRITE(6, 95) NF, ISTAT
00157 470 45 FORMAT(/// 5X, '***** DISPLAY/SETUP3 ... ERROR CONDITION ON ATTEM
00157 480 IPT TO POSITION MPTAP OVER',18,3X, 'FILES'// 5X,
00157 490 2 '***** FSBSFL STATUS CODE =',14,3X, '... ABORTING RUN *****'/111)
00160 500 REWIND MPTAP
00161 510 CALL EXIT
00161 520 C [SET31350
00161 530 C READ MPTAP
00161 540 C-----[SET31370
00161 550 C [SET31380
00161 560 C [SET31390
00162 570 50 CONTINUE [SET31400
00163 580 CATFLG=1
00164 590 READ(MPTAP) CDATE(1),CDATE(2),RMFLG,AMCONB,BMFEAT,NDCLS2,
00164 600 * NQFLO2,NOSUB2,NOFET2,TOTVT2,NDCAT,VARSZ2,
00164 610 * (FETVC2(1),I=1,NOFET2)
00206 620 NCAT=NDCAT
00207 630 IF(NCAT.GT.0)GO TO 55
00211 640 CATFLG=0
00212 650 NCAT=NDCLS2
00212 660 C* SET BASE ADDRESSES FOR TRAINING FIELD INFORMATION
00213 670 55 CONTINUE
00214 680 NOSUB2=NOSUB2+1
```

00215	69.	FLOSV2=1	
00216	70.	VERTX2=FLOSV2 * NOFLO2+4	
00217	71.	FIELD2=VERTX2 * TOTVT2+2	
00220	72.	TOP1= FIELD2 * NOFLO2+5	
00221	73.	NV=TOTVT2+2	
00222	74.	NF=NOFLO2+4	
00223	75.	READ(MAPTAP)(CATNAM(1),1=1,NCAT),(CLSNAM(1),1=1,NOCLS2),	
00223	76.	• (SUBNO(1),1=1,NOCLS2),(SUBNAM(1),1=1,NOSUB2),	
00223	77.	• (ARRAY(FLOSV2-1+1),1=1,NF),	
00223	78.	• (ARRAY(VERTX2-1+1),1=1,NV),	
00223	79.	• (SUBCAT(1),1=1,NOSUB2),(CLSSUB(1),1=1,NOSUB2)	
00223	80.	• (CATNO(1),1=1,NOCLS2),(KEPPTS(1),1=1,NOSUB2)	•NEW
00223	81.	C-	••-1
00223	82.	C-	
00223	83.	C-	
00275	84.	FLOSV3=TOP1	
00275	85.	FIELD3= FLOSV3 * 800	
00275	86.	C-	
00277	87.	RESERVE ROOM FOR 200 TEST FIELDS	
00300	88.	VERTX3=FIELD3 * 1000	
00301	89.	VDIM = TOP - VERTX3	
00302	90.	CALL REDIF3(ARRAY(FLOSV3),ARRAY(FIELD3),ARRAY(VERTX3),VDIM)	
00303	91.	TOP2=VERTX3+TOTVT3+2	
00303	92.	IF(NOFLO3.LE.0)TOP2=TOP1	
00305	93.	C-	
00305	94.	C-	
00305	95.	C-	
00305	96.	C-	
00305	97.	C-	
00307	98.	IF(THRSKY .EQ. 1) GO TO 80	SET31970
00311	99.	IF(EMPTAS .EQ. 2) GO TO 80	SET31980
00313	100.	IF(THRSVA .EQ. 3) GO TO 80	SET31990
00313	101.	C-	SET32000
00313	102.	C-	SET32010
00315	103.	TEST FOR FISHER	
00315	104.	IF(THRSKY.EQ.4) GO TO 80	•NEW
00317	105.	C-	•NEW
00320	106.	NOTHRS = 4	•NEW
00321	107.	80 CONTINUE	•NEW
00323	108.	WRITE(6,819)	•NEW
00323	109.	WRITE(6,802)	•NEW
00325	109.	802 FORMAT(15,' YOU HAVE SELECTED THE FOLLOWING OPTIONS:')	SET32050
00326	110.	IF (NOTHRS .EQ. 4) WRITE(6,803)	SET32060
00331	111.	IF (THRSKY .EQ. 1) WRITE(6,804)	
00334	112.	IF(EMPTAS .EQ. 2) WRITE(6,805)	
00337	113.	IF (THRSVA .EQ. 3) WRITE(6,818)	
00337	114.	C-	•NEW
00337	115.	C-	•NEW
00342	116.	C-	•NEW
00342	117.	C-	•NEW
00345	118.	IF (TANKEY .EQ. 1) WRITE(6,806)	SET32080
00350	119.	IF (TSTKEY .EQ. 1) WRITE(6,808)	SET32090
00353	120.	IF (STATKY .EQ. 1) WRITE(6,810)	SET32100
00356	121.	IF (PCFDKY .EQ. 1) WRITE(6,812)	SET32110
00361	122.	IF(NOMAP.EQ.0)WRITE(6,820)	
00364	123.	IF(PLTKEY.NF.0)WRITE(6,821)	
00367	124.	IF(FILTER.EQ.1)WRITE(6,822)	
00372	125.	IF(DESKEY.EQ.1)WRITE(6,823)	
00375	126.	IF(CRPKEY.EQ.1)WRITE(6,824)CRP	
00401	127.	803 FORMAT(10,'APPLY NO THRESHOLDING')	
00402	128.	804 FORMAT(10,'APPLY CHI SQUARE THRESHOLDS')	
00403	129.	805 FORMAT(10,'APPLY EMPIRICAL THRESHOLDS')	
00404	130.	806 FORMAT(10,'OUTLINE THE TRAINING FIELDS')	SET32140
00405	131.	808 FORMAT(10,'OUTLINE THE TEST FIELDS')	SET32150



```
00406 132= 010 FORMAT(10, 'PRINT OUT THE STATISTICS') SET32160
00407 133= 012 FORMAT(10, 'PRINT THE GROUND TRUTH PERFORMANCE SUMMARIES BY FIELD'
00407 134= * )
00407 135= C- NEW
00410 136= 017 FORMAT(10, 'APPLY FISHER F-DISTRIBUTION THRESHOLDS') NEW
00410 137= C- NEW
00411 138= 010 FORMAT(10, 'APPLY USER INPUT THRESHOLD VALUES')
00412 139= 019 FORMAT(////)
00413 140= 020 FORMAT(10, 'DO NOT DISPLAY A CLASSIFICATION MAP')
00414 141= 021 FORMAT(10, 'DISPLAY THE HISTOGRAMS OF THE QUADRATIC FORM FOR ALL S
00414 142= *UBCLASSES')
00415 143= 022 FORMAT(10, 'PERFORM SPATIAL FILTERING')
00416 144= 023 FORMAT(10, 'EXCLUDE PIXELS IN THE DESIGNATED AREAS FROM CLASSIFICATION
00416 145= *TION SUMMARIES')
00417 146= 024 FORMAT(10, 'PRINT THE INTENSIVE TEST SITE SUMMARY REPORT FOR ', 46)
00417 147= C SET32190
00417 148= C SET32200
00417 149= C SET32250
00420 150= CALL WRTFLD(ARRAY(FLOSV2), ARRAY(VERTEX2), NOFLD2, 1, CLSNAM, SUBNAM)
00421 151= IF(NOFLD3, LE, 0) GO TO 85
00423 152= IF(TSTKEY.EQ.1) K=2
00425 153= IF(DESKEY.EQ.1) K=3
00427 154= CALL WRTFLD(ARRAY(FLOSV3), ARRAY(VERTEX3), NOFLD3, K, CLSNAM, SUBNAM)
00430 155= 85 CONTINUE
00430 156= C- WILL PCTAB FIT IN ARRAY?
00431 157= NOTAFD=NOFLD2
00432 158= IF(TSTKEY.EQ.1) NOTAFD=NOFLD3
00434 159= PCTSZ=NOTAFD*NDSUB2
00435 160= IF(PCTSZ, LE, TOP-TOP2) TO 106
00435 161= C- MOVE TEST FIELD INFO. NO GAPS ARE IN ARRAY (IF STORAGE IS NEEDED)
00437 162= IF(TSTKEY.EQ.0) GO TO 1
00437 163= C- MUST TRAINING FIELD INFO BE KEPT IN CORE?
00441 164= IAD=FLOSV2-1
00442 165= IF(TANKEY.EQ.1) IAD=TOP1-1
00444 166= IBD=FLOSV3-1
00445 167= NF=4*NOFLD3
00446 168= TIME=0
00447 169= 99 DO 101 I=1, NF
00452 170= 101 ARRAY(IAD+1)=ARRAY(IBD+1)
00454 171= IF(TIME, GT, 0) GO TO 102
00456 172= IAD=IAD+NF
00457 173= IBD=IBD+NF
00460 174= NF=5*NOFLD3
00461 175= TIME=TIME+1
00462 176= GO TO 99
00463 177= 102 IF(TIME, EQ, 2) GO TO 103
00465 178= IAD=IAD+NF
00466 179= IBD=IBD+NF
00467 180= NF=TOTAL3-2
00470 181= TIME=TIME+1
00471 182= GO TO 99
00472 183= 103 CONTINUE
00473 184= FLOSV3=TOP1
00474 185= IF(TANKEY.EQ.0) FLOSV3=1
00476 186= FIELD3=FLOSV3 + 4*NOFLD3
00477 187= VERTEX3=FIELD3 + 5*NOFLD3
00500 188= TOP2 = VERTEX3 + 2*TOTAL3
00501 189= 105 IF(PCTSZ, GT, TOP-TOP2) GO TO 508
00503 190= 106 PCTID3=TOP2
00503 191= C- SET UP FIELD ARRAY FOR TRAINING FIELDS
00504 192= IF(TSTKEY.EQ.0, OR, TANKEY.EQ.1) CALL FIFLD(ARRAY(FLOSV2),
00504 193= * ARRAY(FIELD2), ARRAY(VERTEX2))
00504 194= C-
```



```
00504 195* C* SET FLOKEY
00504 196* C*
00504 197* IF(ISTKEY.EQ.1)CALL SETKEY(ARRAY(FLOSV3),NOFLO3)
00510 198* IF(ISTKEY.NE.1)CALL SETKEY(ARRAY(FLOSV2),NOFLO2)
00512 199* 200 RETURN SETJ2260
00512 200* C SETJ2270
00512 201* C ERROR ROUTINES SETJ2280
00512 202* C ----- SETJ2290
00512 203* C SETJ2300
00512 204* C SETJ2340
00513 205* 508 WRITE (6,5044) SETJ2350
00515 206* 5044 FORMAT(//// 5X,'***** DISPLAY/SETUP3 --- CORE OVERFLOW -----'
00515 207* 1- EXECUTION TERMINATED ***** / 1H1)
00516 208* CALL EXIT SETJ2370
00516 209* C*
00516 210* C* INTERNAL ROUTINE TO FIND RECTANGULAR COORDINATES FOR TRAINING FIELDS
00516 211* C*
00522 212* SUBROUTINE FIFLD(FLOSAV,FIELDS,VERTEX)
00522 213* DIMENSION FLOSAV(4,NOFLO2),FIELDS(5,NOFLO2),VERTEX(2,TOTVT2)
00523 214* IB=1
00524 215* IPT=1
00525 216* DO 20 I=1,NOFLO2
00530 217* SAMSTX = 100000
00531 218* SAMEND = 0
00532 219* LINSTX = 100000
00533 220* LINEND = 0
00534 221* NV = FLOSAV(4,I)
00535 222* FIELDS(5,I)=IPT
00536 223* IPT=IPT+NV*2
00537 224* IE=IB+NV-1
00540 225* DO 10 J=IB,IE
00543 226* SAMSTX = MIN(SAMSTX,VERTEX(1,J))
00544 227* SAMEND = MAX(SAMEND,VERTEX(1,J))
00545 228* LINSTX = MIN(LINSTX,VERTEX(2,J))
00546 229* 10 LINEND = MAX(LINEND,VERTEX(2,J))
00550 230* FIELDS(1,I)=LINSTX
00551 231* FIELDS(2,I)=LINEND
00552 232* FIELDS(3,I)=SAMSTX
00553 233* FIELDS(4,I)=SAMEND
00554 234* IB=IE+1
00555 235* 20 CONTINUE
00557 236* RETURN
00557 237* C*
00557 238* C* INTERNAL ROUTINE TO SET FLOKEY=1 IF FIELDS ARE ASSOCIATED
00557 239* C* WITH SUBCLASSES,OTHERWISE = 0
00557 240* C*
00560 241* SUBROUTINE SETKEY(FLOSAV,NOFLD)
00563 242* DIMENSION FLOSAV(4,NOFLD)
00564 243* FLOKEY=1
00565 244* DO 10 I=1,NOFLD
00570 245* IF(FLOSAV(3,I).EQ.0)GO TO 20
00572 246* 10 CONTINUE
00574 247* RETURN
00575 248* 20 FLOKEY=0
00576 249* RETURN
00577 250* END SETJ2380
```

END OF COMPILATION: NO DIAGNOSTICS.
SETUP3 SYMBOLIC
SETUP3 CODE AFLOCATRLF

16 AUG 76	14:18:29	0	02405116	14	239	(DELETED)
16 AUG 76	14:18:29	1	02413540	36	1	(DELETED)
		0	02413604	14	102	

APPENDIX C
MAPTAP FORMAT

MAPTAP FORMAT

The tape, MAPTAP, is output by the processor CLASSIFY. It contains the statistics actually used in classification, the training field, category, class, and subclass information, and the classified data.

Each file consisting of the following types or records:

	4 - run header records
Repeated for each classified field	1 - field header record
	N - data records
	1 - end-of-field record
	1 - end-of-run record
	end-of-file mark

All records are written with a nonformatted FORTRAN write statement.

RUN Header Record 1

```
WRITE(MAPTAP) (DATE(I), I=1, 2), BMFLG, BMCOMB, BMFEAT, NOCLS2,  
               NOFLD2, NOSUB2, NOFET2, TOTVT2, NOCAT, VARSZ2,  
               (FETVC2(I), I=1, NOFET2)
```

FORTRAN NAME AND DIMENSION

DESCRIPTION

DATE(2)	Date classification was performed
BMFLG	Flag indicating B-MATRIX was used in classification
BMCOMB	No. of linear combinations in B-MATRIX

FORTTRAN NAME
AND DIMENSION

DESCRIPTION

BMFEAT	No. of channels used in computing the B-MATRIX
NOCLS2	No. of classes
NOFLD2	No. of training fields
NOSUB2	No. of subclasses
NOFET2	No. of channels used in classificatio
TOTVT2	No. of vertices in training fields
NOCAT	No. of categories
VARZ2	Size of covariance for each subclass
FETVC2(NOFET2)	Actual channels used in classificatio

RUN Header Record 2

WRITE(MAPTAP) (CATNAM(I), I=1, NOCAT1), (CLSMTX(I), I=1, NOCLS2),
(SUBNO(I), I=1, NOCLS2), (SUBDES(I), I=1, NOSUB2),
((FLDMTX(I, J), I=1, 4), J=1, NOFLD2), ((VERTEX(I, J),
I=1, 2), J=1, TOTVT2), (SUBCAT(I), I=1, NOSUB2),
(CLSV2(I), I=1, NOSUB2), (KATNO(I), I=1, NOCLS2),
(KEPPTS(I), I=1, NOSUB2)

FORTTRAN NAME
AND DIMENSION

DESCRIPTION

CATNAM(NOCAT1)	Category names (if available) NOCAT1 = no. of categories if CATEGORY classifier was applied NOCAT1 = no. of classes if STANDARD classifier was applied.
CLSMTX(NOCLS2)	Class names

FORTTRAN NAME
AND DIMENSION

DESCRIPTION

SUBNO (NOCLS2)	No. of subclasses in each class
SUBDES (NOSUB2)	Subclass names
FLDMTX (4, NOFLD2)	Training field information 1 - field name 2 - Class number field belongs to 3 - Subclass number field belongs to 4 - No. of vertices in this field
VERTEX (2, TOTVT2)	Vertices for all the fields Vertices are ordered (sample, line) ₁ , (sample, line) ₂ , ..., (sample, line) _{TOTVT2}
SUBCAT (NOSUB2)	Contains the category number to which each corresponding subclass belongs
CLSVC2 (NOSUB2)	Contains the class number to which each corresponding subclass belongs
KATNO (NOCLS2)	Contains the category number to which each class belongs
KEPPTS (NOSUB2)	Contains the total number of training field pixels in each subclass

RUN Header Record 3

WRITE (MAPTAP ((COVMTX (I, J), I=1, VARSZ2) J=1, NOSUB2)
((AVEMTX (I, J), I=1, NOFET2), J=1, NOSUB2)

FORTTRAN NAME
AND DIMENSION

DESCRIPTION

COVMTX (VARSZ2, NOSUB2)	Original or B-transformed covariance matrix for each subclass
AVEMTX (NOFET2, NOSUB2)	Mean vector for each subclass

APPENDIX D
ERROR MESSAGES

DIAGNOSTICS(Display Processor)

1. *****DISPLAY/SETUP3 ... ERROR CONDITION ON ATTEMP TO
POSITION MAPTAP OVER _____ FILES.
*****FSBSFL STATUS CODE = _____... ABORTING RUN ***

The system routine FSBSFL for positioning files has encountered difficulties in positioning the MAPTAP to correct file. Error occurred in SETUP3 routine for DISPLAY.

User should make sure he has indicated the correct file number for the MAPTAP, and that the MAPTAP does in fact have the correct number of files.

2. ***DISPLAY/SETUP3 --- CORE OVERFLOW --- EXECUTION TERMINATED***

Subroutine SETUP3 computes the storage needed for the specific problem, if more is needed than available this diagnostic is printed.

3. AA0650 INVALID SUPERVISOR CONTROL CARD.

The invalid card is printed along with this message. Check the spelling of the KEYWORD.

4. WRITE ON UNIT N TERMINATED ABNORMALLY DAS TAPE NOT
CREATED. ISTAT = _____.

Attempt to write on DAS output tape failed. This usually indicates a bad tape. ISTAT is the status code returned from the system binary I/O routine NTRAN. Execution continues.

5. END OF TAPE ENCOUNTERED ON DAS UNIT LAST LINE = N.

The end-of-tape marker was encountered on the DAS output tape. The last line written was N. Execution of DISPLAY continues without further attempts to write on DAS tape.

6. *****FISHER THRESHOLD REQUESTED-NOT PERFORMED
...NO. SAMPLES FOR SUBCLASS "NAME" (=N) IS LESS
THAN OR EQUAL TO NUMBER OF CHANNELS (=M)

The program compares the number of samples (pixels) for each training subclass to the number of channels. If the number of samples is less than or equal the number of channels, the threshold request is bypassed for the subclass.

7. FDIST-OVERFLOW CONDITION IN FISHIN ROUTINE FOR
SUBCLASS=XXXX. THRESHOLD SET TO 999.999

The FISHIN routine has returned an overflow condition. The threshold value is set to 999.999 by the program, for the subclass.